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THE ANATOMY OF THE SPHENOIDAL SINUS AND THE METHOD OF APPROACHING IT FROM THE ANTRUM.*

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Until within a few years the accessory sinuses of the head have been considered as separate and unrelated cavities. Gradually, however, it has become evident that certain of these cavities, notably the frontal sinus and the antrum, are related anatomically and often pathologically; also that the ethmoid cells, the half way station between these two, are related to both. Now it is becoming clear that the sphenoidal sinus, which has been considered so far off and so isolated, is much less so than is supposed. Of late a great deal of work has been done on the sinuses, and many names appear in connection with investigations along these lines, notably the names of Douglas, Cryer, Lothrop, Onodi, Jansen and Furet. There has been published within the last twelve months a book on the nasal fossæ which deserves the word monumental. It is a joint compilation by Sieur and Jacob of Paris. The minuteness with which they have gone over the subject, the beauty of their illustrations and the clearness of their text arouse in the reader the feeling both of wonder and despair. What I have to say is largely a condensation of their chapter on the sphenoidal sinus, supplemented by observations and measurements of my own..

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The classical description of the sphenoid bone begins by stating that it consists of a body and three sets of wings. The body is quadrilateral and hollowed by a cavity called the sinus. One large venous sinus—the cavernous—and four small ones, touch this bone, and three chief arteries of the skull touch it or pass through foramina in it, six of the twelve cranial nerves are in relation with it, all the bones of the skull centre round it, and five of the bones of the face articulate with it, and it comes into relation with the cerebellum and the three basal lobes of the brain.

Most of the important structures which are related to the sphenoid bone center upon the sinus. The anatomy of the sinus and the method of approaching it is the subject of this paper.

I shall take the liberty to put in clinical remarks and applications as I go along rather than to group them formally under one head.

Absence of the Sinus.—Absence of the sinus has been reported a few times. (Zuckerkindl-Hertzfeld, 1898). I found it wanting once in one hundred heads.

Size.—The sinus is often larger on one side than on the other, with the difference generally in favor of the left. It may hold only a drop of water or may be large enough to hold 9 c. c. (3 drachms). The average amount is 5-6 c. c. ($1\frac{1}{2}$ drachms).

Form.—In form the sinus is usually a cube, but the regularity of this is broken by the indentation in the superior wall caused by the sella turcica and by the pressing in of the cavernous sinus on the two sides.

The Cavity of the Sinus.—The sinus has a median partition. Often this is not symmetrically placed so that one sinus may be much the larger. In such a case the larger and predominating sinus can be in relation with the cavernous sinus on both sides, and in this way a left sinus could give trouble with the right optic nerve. Occasionally the sinus has a partial double partition. In young subjects the septum, between the two halves is very thick. In young subjects also, the sinus does not extend back of the optic foramen, while in the normal adult it reaches the middle of the sella turcica. Like all the other sinuses the sphenoidal sinus enlarges progressively with increasing age. The average antero-posterior diameter is 1-2 c. c., or one-half to three-quarters of an inch.

The cavity of the sinus is narrowed by the optic groove in front and often behind by the ethmoid cells.

It is much more important clinically to know that the sinus is often enlarged. This enlargement is brought about by various prolongations. These are:—

1. A prolongation of the sinus backward by the increase of the absorption of the bony substance of the body of the bone. This, of course, is the commonest method by which the sinus is enlarged.

2. A prolongation into the lesser wing.

3. A prolongation laterally into the great wings of the sphenoid. Combined with this there is often an excavation of the base of the pterygoid plates.

4. A prolongation forward toward the antrum.

Development.—The sphenoidal sinus begins to develop soon after birth, but does not get its complete development until between the 20th and 25th year. It is formed by the sphenoidal turbinate, and by a prolongation of the nasal mucous membrane. The sphenoidal turbinate is a small triangular piece of bone, which is developed in

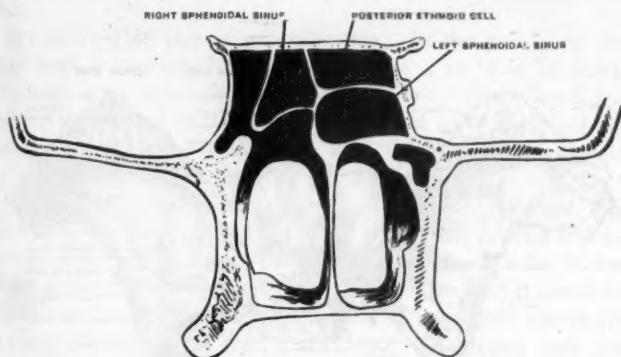


Fig. 1.—Specimen showing the ethmoid cells extending back over the sphenoidal sinus.—Sieur and Jacob.

the posterior superior angle of the ethmoid region. At the end of the first year the sinus consists of a cavity surrounded by a capsule, which belongs entirely to the sphenoidal turbinate. This capsule seems to start from the turbinate as a base and grow backward, like a soap bubble from a pipe. In the anterior part of the capsule there is an opening, which is the ostium. From the second to the third year the cavity is the size of a pea. At four years the sphenoidal turbinate itself begins to be absorbed and the lateral and median parts of the capsule disappear. At ten years, only the anterior and inferior parts of the capsule, which sprung from the sphenoidal turbinate, are left. At nine to twelve years, the role of

the sphenoidal turbinate is over and the bone of the body of the sphenoid itself is invaded. At this time also the sphenoidal turbinates fuse with the face of the sphenoid.

The Mucous Membrane of the Sinus.—The mucous membrane of the sphenoidal sinus is a prolongation from the nasal mucous membrane. It is thin and very lightly attached. If there is a very large ostium it forms a diaphragm over it with an opening in the centre. There are the usual three layers—the mucous, sub-mucous and the periosteal. It is a ciliary membrane, the same as the mucous membrane of the nose. Grouped about the ostium there are many glands. These occasionally degenerate into cysts. Many vessels run in the sub-mucous layer. At the optic foramen these communicate freely with the vessels of the orbit. The lateral wall of the sphenoidal sinus is cribriform with minute foramina, through which vessels run from the sphenoidal sinus into the cavernous

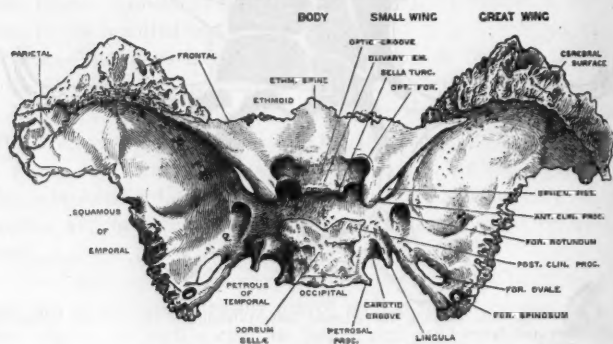


Fig. II.—The sphenoid bone, from above.—Quain.

sinus. There is a venous connection also through the sella turcica and through the anterior face into the posterior ethmoid cells. The arteries which supply the sinus are the sphenopalatine, the pterygopalatine and Vidian—all branches of the internal maxillary artery in the sphenomaxillary fossa. Branches of the sphenopalatine artery cross the face of the sinus and enter the ostium to supply the inside. The other two arteries lie on the under side of the body and run in bony canals. The elaborate venous anastomoses readily account for the extension of sinus inflammation to the dura and to the optic nerve and the orbit.

Lymphatics.—The lymphatics join both the deep lymphatics of the neck and those at the base of the brain.

The Relations of the Different Faces of the Sinus.—The Upper Surface: This surface is intra-cranial. From before backward it is made up first of a portion of the lesser wing. Then comes the olivary groove and eminence, and next the surface falls sharply in the sella turcica, to rise again into the posterior clinoid processes and the back of the saddle. In a large sinus this face comes into relation anteriorly with the posterior ethmoid cells and posteriorly with the basilar groove. The length in such cases may be 20-31 m. m. ($\frac{3}{4}$ - $1\frac{1}{4}$ inch). A small sinus does not extend back of the optic groove. In young subjects also this line is the limit of the sinus. It is only at about 12-15 years that the sinus reaches the bottom of the sella turcica. Finally, the posterior ethmoidal cells may extend backward and lie under what is usually the superior surface of the sinus.

Structure.—This face is generally thin. In the young, on the other hand, it is generally thick, 3-6 m. m. ($\frac{1}{8}$ to $\frac{1}{4}$ of an inch). In a large sinus especially is the roof very thin. Zuckerkandl has reported the absence of this upper wall. Sieur and Jacob have not observed its absence, but have seen it so thin that the dura could not be removed without bringing this wall with it.

Relations.—The principal relation is, of course, the dura. In front there are the optic nerves and the ophthalmic arteries imprisoned on either side in the optic canal. Back of these on the thicker olivary eminence is the optic chiasma. The fact that this is placed on thicker bone has been given as the reason why the optic nerves are so much oftener affected than the chiasma. Continuing back you find in the cavity of the sella turcica the pituitary gland. Tumors from this occasionally invade the sinus. The upper surface also has a venous sinus in relation with it, the coronary.

The External Wall.—From before backward the following structures are noticed, the optic canal again, the sphenoidal fissure and then the large cavernous sinus and finally the internal carotid artery. Outside of the cavernous sinus, anteriorly, is the foramen rotundum, carrying the superior maxillary nerve, and posteriorly the foramen ovale carrying the inferior maxillary nerve.

The Relations.—A mere mention of the structures near at hand suggests at once how important the relationships are. The relationship to the cavernous sinus is, on the whole, the most important. Within this there are the internal carotid artery, the motor nerves of the eye, and the first branch of the great fifth. Therefore,

when you curette the external surface of the sphenoid as advised by Grünwald you are treading on thin ice. I have one specimen in which both the ophthalmic and the internal carotid arteries project into the sinus, and would be in danger from such curetting.

There is still another small venous sinus, the inferior petrosal, in relation with this wall.

Structure.—The external wall is like the superior fragile. Fractures of the base of the skull by extending through it readily open up the important blood channels which have just been mentioned. This would give profuse epistaxis. Bullet wounds through the mouth for suicidal purposes often do the same thing. Hemorrhage

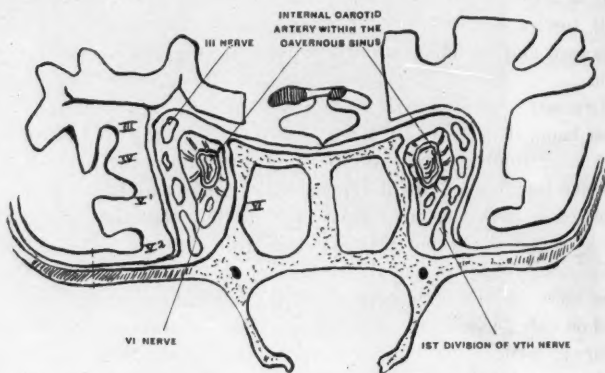


Fig. III.—Figure showing the relation of the outer wall of the sphenoidal sinus to the cavernous sinus. The contents of the cavernous sinus (the third, fourth and first division of the fifth nerve, the sixth nerve and the internal carotid artery) are also shown.—Sieur and Jacob.

plus eye symptoms would be the diagnostic signs by which a lesion could be localized here. If there is a very irregular sinus, the injury could be on one side and the hemorrhage come from the other. Disease of this wall of the sinus gives progressive ocular troubles, violent pain, epileptiform attacks, crises of vomiting, meningitis, and finally brain abscess.

The Posterior Wall.—This wall is intra-cranial. It is hollowed out by the basilar groove. In this lies the basilar artery and the medulla oblongata and pons. Here again there is another venous sinus, the occipital. There are venous sinuses, therefore, on three sides of the body of the sphenoid, the superior, the external and on the posterior.

A large sphenoidal sinus may extend fully to the posterior wall. Anatomically such a sinus, if diseased, would give the following symptoms: Occipital headache, vertigo, vomiting, epileptiform attacks, involvement of the nerves of the eye and alteration of the fundus. In addition there would be symptoms of involvement of the meninges. Ordinarily, however, the sinus does not extend to the posterior wall so that such an extensive array of signs would be exceptional.

The Inferior Surface.—This surface is in relation with the nose and the pharynx. Through a small foramen in it runs the pterygo-palatine nerve. The width of this surface varies from 20-25 m. m.

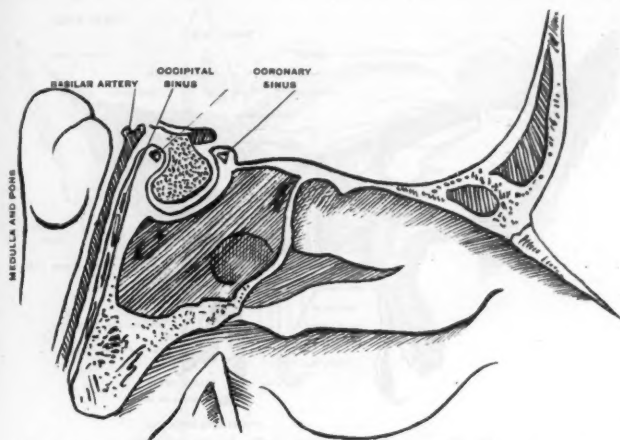


Fig. IV.—Figure showing a large sphenoidal sinus which extends to the posterior wall of the body of the bone.—Sieur and Jacob.

($\frac{3}{4}$ to 1 inch.) It is too thick to puncture easily, 3 m. m. 10 ($\frac{1}{8}$ to $\frac{3}{8}$ of an inch). In two-thirds of the cases this surface does not reach the pharynx. The mucous membrane over it is 3-4 m. m. thick ($\frac{1}{8}$ inch). The mucous membrane has much fibrous tissue in it. The membrane thins out as it turns up onto the anterior face of the sphenoid. From this region and from this membrane start the fibromata and the myxomata of the vault. This locality is supplied by the pterygo-palatine and the Vidian arteries. The width of the right choana is 12-13 m. m. ($\frac{1}{2}$ inch) of the left 17 m. m. ($\frac{5}{8}$ +). In a large sinus the length of the inferior surface often is 30 m. m. ($1\frac{1}{4}$ inch). Only in a very large sinus would an attempt to make an opening here be justifiable,

Relations.—The middle lacerated foramen containing the internal carotid artery is in relation with the inferior surface. In a wide sinus the Vidian nerve lies in the floor. This is the motor nerve of the sphenopalatine ganglion. In the pterygoid prolongation of the sinus this nerve is again exposed.

Of the three faces of the sphenoidal sinus so far but one, the inferior, is approachable for therapeutic surgery, and even this one is not generally practicable. There remains, therefore, only the anterior face. Fortunately this can be approached in at least two ways.

The Anterior Face.—This face is divided into two parts, an outer

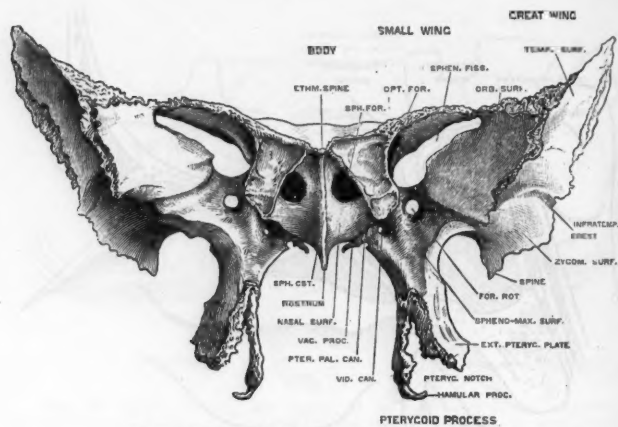


Fig. V.—The sphenoid bone, from before.—Quain.

which abutts against the posterior ethmoid cells and an inner, which is free and forms the upper and back wall of the nose. To the middle of the free part the septum of the nose is continued back and forms there a median partition. The transverse measurement of this face is from 28-30 m. m. ($1\frac{1}{4}$ inch). In a well developed sinus this face makes a right angle with the cribriform plate, and averages in height 16-18 m. m. ($\frac{3}{4}$ inch).

The Ostium.—The drainage opening of the sinus is placed in this face. The ostium, as the opening is called, is situated nearer the upper border than the lower. Generally it is 4 m. m. ($\frac{1}{8}$ inch) from the top, or 8-10 m. m., ($\frac{1}{4}$ + inch) from the bottom. The opening measures 2-3 m. m. ($\frac{1}{8}$ inch) vertically, and 1-2 m. m.

(1-16 inch) transversely. In a majority of cases the opening cannot be seen unless the middle turbinate is first removed. The distance from the centre of the nasal opening is 5-8 c. c. (2 inch to $3\frac{1}{8}$ inch) and from the nasal spine $6\frac{1}{2}$ to 7 c. c. ($2\frac{1}{2}$ to $2\frac{3}{4}$ inch). The spine is hard to find. The middle of the anterior nares is a variable point. I prefer, therefore, to measure from the lower border of the lateral cartilage, where this turns round to make the posterior boundary of the meatus. So measured, the distance of the ostium is $2\frac{3}{8}$ inches, or 6 c. c. When the ostium is entered, and this is generally told by a feeling resistance overcome as the probe passes through, the examining or curetting instrument has on an average a working distance of 1-2 c. c. ($\frac{3}{8}$ to $\frac{3}{4}$ inch). Owing

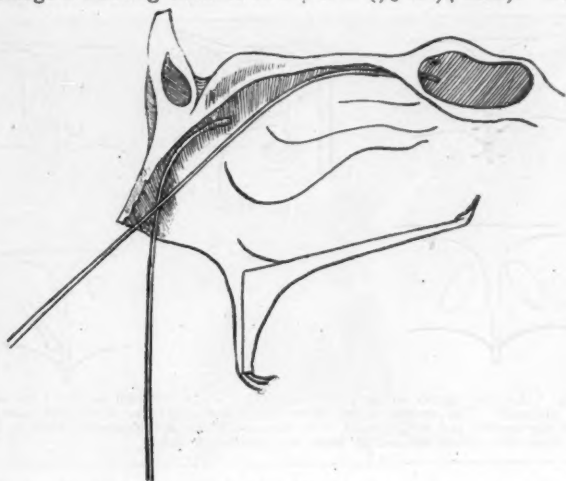


Fig. VI.—Method of catheterizing the sphenoidal sinus.—Sieur and Jacob.

to the high position of the ostium the sinus fills with secretion during the night and empties itself in the morning when the patient assumes the upright position.

A word or two here may not be amiss on the method of catheterizing the sinus. According to Sieur and Jacob there always remains a channel back to the sinus along the floor of the cribriform plate. Adhesions, spurs and deflections, they say, never interfere in this region. All will agree that this is a very acceptable condition of affairs. In order to catheterize after their method the head of the patient is tilted a little upward and the catheter introduced to the floor of the cribriform plate and then the handle gradually elevated as the instrument is pushed backward until it meets the top of the anter-

ior face of the sphenoid in the sphenoidal recess. "Then a gentle see-sawing motion is sufficient in the majority of cases to engage the instrument in the opening of the sinus."

The instrument should have the same curve as the Eustachian catheter, but should be of much smaller diameter, 2 m. m. (1-16 + inch) is the measurement recommended by the authors.

I have found that a curve somewhat less than that which is usually employed on the Eustachian catheter to work better. Too much of a curve causes the probe to glide down the face of the sphenoid and not to engage in the anterior superior angle. If, however, the probe is too straight there is danger of its not sliding along

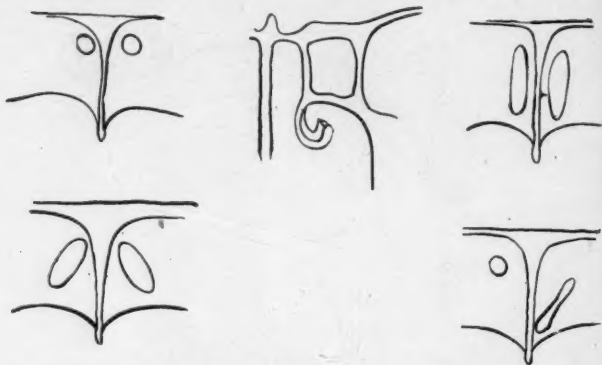


Fig. VII.—The figures on the right and left show the different forms of the ostium of the sphenoid. The central figure shows the space under the cribriform plate, and between the septum and the ethmoid cells, through which the sphenoidal sinus is catheterized after the method advised by Sieur and Jacob.—Mosher.

the cribriform plate but of engaging it and perhaps of perforating it. A straight probe also infringes on the middle turbinate. The probe should be bent 20-30° off the horizontal.

This method of catheterizing in brief is this: Pass the probe to the anterior superior angle of the sphenoid, bring the point downward, still keeping it in contact with the face, and turn slightly outward.

In regard to this procedure I should like to say that I have not found on the cadaver that there is always a clear passage beneath the cribriform plate. In the great majority there has been one. So that if in life the method should be practicable only in one-half of the cases it is of value. Naturally

in those fortunate cases where the ostium is visible no such manipulation is necessary. In 17 subjects at the end of the dissection period, when they were a good deal dried and had in no way been prepared for this procedure, I succeeded easily in finding the ostium in slightly over half the cases.

Measuring from the tip of the nose is measuring from a variable point, but that is about the best that can be done under these circumstances. In a small head I found the distance to the anterior superior angle of the face of the sphenoid to be $2\frac{1}{2}$ inches ($6\frac{1}{2}$ c. c.) and the distance to the posterior wall of the sinus, after the ostium

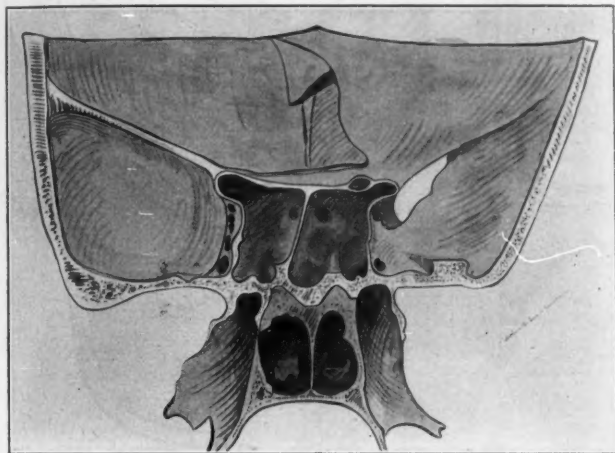


Fig. VIII.—Prolongation of the sphenoidal sinus into the lesser wings. On the right the optic canal is shown in the roof of the prolongation.—Sieur and Jacob.

was entered, to be 3 inches ($7\frac{1}{2}$ c. c.) The results of the few measurements which I had a chance to make on this point were that if in catheterizing the sphenoidal sinus after this method the probe or catheter rested against the anterior superior angle of the sphenoid the distance was one-quarter of an inch over or under 3 inches, or in the majority of cases 3 inches, and that the probe entered from a half to three-quarters of an inch further before it struck the posterior wall of the sinus.

The Sphenoidal Recess.—Just in front of the anterior face of the sphenoid and separating this from the posterior ethmoid cells, there

is a vertical slit called the sphenoidal recess. The height of the recess is 12 m. m. ($\frac{1}{2}$ inch), and its width, 5-6 m. m. ($\frac{1}{4}$ inch). Some of the posterior ethmoid cells empty into this as does also the sphenoidal sinus. From their nearness the posterior ethmoid cells can be easily infected by pus from a diseased sinus, and *vice-versa*. The mission of this slit is to carry secretion from these cells and from the sinus down into the choanæ. Thus it is that pus seen

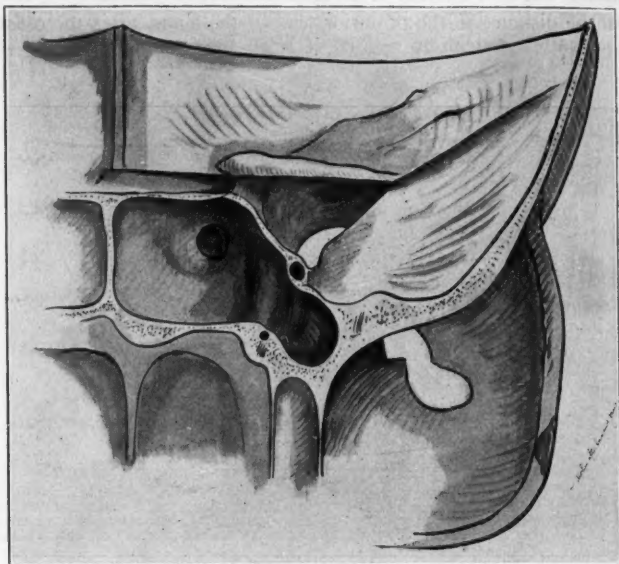


Fig. IX.—Prolongation of the sphenoidal sinus into the great wings. The dark marking in the upper wall of the prolongation is the foramen rotundum, and the smaller one in the lower wall is the Vidian canal.—Sieur and Jacob.

by the posterior mirror in the superior meatus and on the upper rim of the choanæ is used as a sign of disease in the sphenoidal sinus. Polypi in this region raise the same suspicion.

Until lately it has been usual to approach the sphenoidal sinus by resecting the middle turbinate and then breaking through the lower part of this anterior face by an instrument introduced through the nose. This is the method of Grünwald and Hajeck.

All these anatomical details have been given in order to clear the way for the discussion of a newer route, namely, the route through

the antrum. There is a little more anatomy, and I am glad to say newer anatomy to take up first, namely, the anatomy of the prolongations.

Prolongations.—Important as the relations of the different faces of the sphenoid are, it is of even greater clinical importance to appreciate that the sphenoidal sinus frequently sends out prolongations which make it less isolated by bringing it into relation with the more accessible sinuses. These prolongations have been mentioned before as the means by which the cavity of the

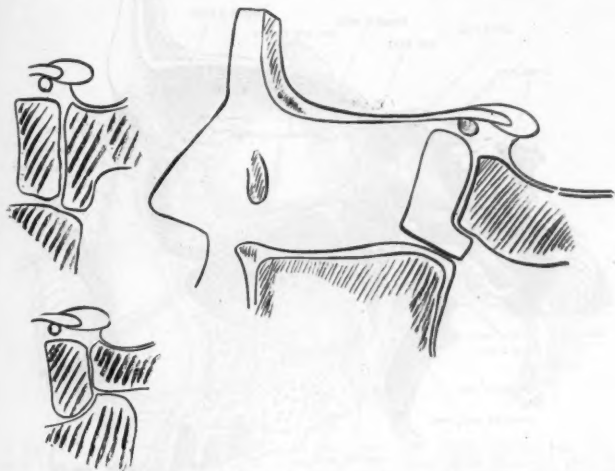


Fig. X.—(1) The largest figure shows a posterior inferior ethmoid cell between the sphenoid behind and the antrum in front. (2) The upper left hand figure shows the posterior ethmoid cell united to the sphenoid, and making the antrum prolongation of the sphenoidal sinus. (3) The lower left hand figure shows the antrum increased in size by the absorption of this cell.

sinus is often enlarged. I come to them now in order and wish to take them up in some detail.

In rather rare cases prolongations are found running into the posterior clinoid processes or into the break of the sphenoid. These are not common and are not important. There are three varieties, however, which are not only common but very important. These are:—

1. A prolongation into the lesser wings. The importance of this is that it tends to weaken the optic groove, and in cases of

trauma to determine the point of fracture here. It furnishes a better chance for pus from a suppurating sinus to infect the optic nerve. This prolongation occurs once in twelve cases.

2. A prolongation into the great wings of the sphenoid and into the base of the pterygoid plate. This is found once in six subjects, and is seen only in very large sinuses. It is often greater on one side than on the other or even unilateral. It projects outward between the foramen rotundum and the foramen ovale, that is, between the superior and the inferior maxillary nerves. Sometimes

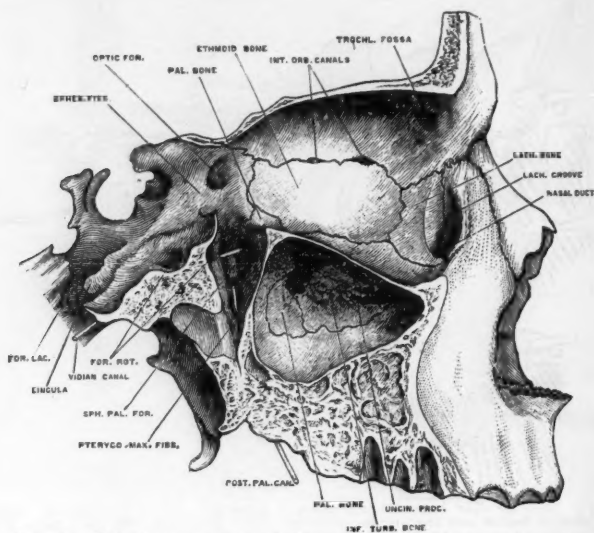


Fig. XI.—Sagittal section of the facial portion of the skull. This section shows the inner wall of the orbit, the inner wall of the antrum and the sphenomaxillary fossa.—Quain.

the prolongation extends down the side of the chaonæ for 5-6 m. m. ($\frac{1}{4}$ inch). In one case in six, where the prolongation is found, it reaches as far outward as the foramen ovale. Then it would be separated from the two nerves and the two foramina by a thin partition of bone or in some instances only by mucous membrane. This prolongation explains readily the involvement of the two maxillary nerves in affections of the sphenoidal sinus. Where this prolongation is present there is danger in the operation at the foramen rotundum for the resection of the Gasserian ganglion of break-

ing into the sinus. On account of the widening of the floor of the sinus the Vidian nerve is in the floor of the prolongation and so exposed. Whenever the two choanae are found to be very large it should arouse a suspicion that this prolongation may exist.

3. A prolongation forward at the anterior inferior angle. This is called the palatine prolongation, because it comes into relation with the palate bone. The name maxillary, or antrum prolongation, would suggest better its anatomical and clinical bearings.

This prolongation is the most common of all, as it is found in one-fourth of all the sinuses. I found it twice in the last eighteen subjects in the dissecting room. At the posterior inferior part



Fig. XII.—(1) Shows the division of the inner wall of the antrum into two triangles by the insertion of the inferior turbinate. (2) Drawing to show the point from which measurements were taken. This point is the lower edge of the posterior rim of the nasal opening.

of the ethmoid region there is an ethmoid cell which plays the role of a go-between between the sphenoid behind and the antrum in front. This cell is normally in relation with the outer half of the face of the sphenoid. It corresponds to the anterior inferior angle of the sphenoid and to the posterior superior angle of the antrum. It may be absorbed by the antrum or by the sphenoid. When the cell is absorbed by the sphenoid a cul-de-sac is formed which runs obliquely forward, outward and downward. It may be 4-6 m. m. ($\frac{1}{8}$ - $\frac{1}{4}$ inch) broad and 5-6 m. m. ($\frac{1}{4}$ inch) long. Often the partition which separates this prolongation from the antrum is made of thick bone, but again it is common to have it composed of translucent bone, which could easily be absorbed by pus.

Relations.—Above are the posterior ethmoid cells, of which this prolongation is a derivative. Below and toward the inside is the sphenopalatine foramen, and to the outside, in the sphenomaxillary fossa, is the superior maxillary nerve with the sphenopalatine ganglion hanging from it like a spider; behind is the sphenomaxillary fossa, and directly below a part of the superior meatus. The importance of this prolongation, of course, is that it unites the sphenoid and the antrum. It was proposed to enter the sphenoid through the posterior superior angle of the antrum where this prolongation is so frequent. There were too many important relations, however, and the way too narrow for the procedure to become much used.

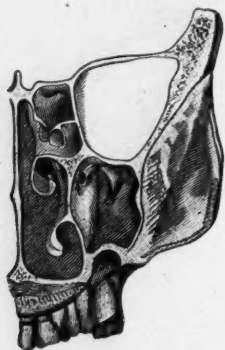


Fig. XIII.—Is a horizontal section through the antrum, about one-quarter of an inch behind the ostium. It shows the ethmoid parallelogram nicely, especially the lower outer angle, where it meets the orbit and the antrum. The anterior part of the inner wall of the antrum is also shown. The dark spot in the upper part of this is the ostium. In front of the ostium is the swelling made by the lachrymal duct. From this figure it is plain how an instrument entered at the ostium and pushed diagonally upward at once enters the ethmoid parallelogram.

So much for the anatomy of the sphenoid. I wish now to discuss the method of approaching it.

For this purpose the inner wall of the antrum has an especial importance. This wall is roughly quadrilateral, and is divided into two parts by the insertion of the inferior turbinate. The line of the insertion of the turbinate runs from the anterior superior angle to the middle of the posterior border. The part of the wall above this line belongs to the middle meatus and the part below to the inferior meatus. The part above this line, or the superior triangle, is mostly membranous. It is bounded above by the pos-

terior ethmoid cells, in front by the unciform process of the ethmoid, behind by the vertical plate of the palate bone. The accessory ostium of the antrum (which occurs once in five cases) is simply a further subdivision of this superior triangle by a branching process of the unciform process. Therefore, it is not so often pathological as is ordinarily supposed. The unciform process is very thin and of no operative importance.

The ostium is also in this anterior superior angle of the inner wall of the antrum. It is bounded in front and above by the unciform process, below by the inferior turbinate and behind by the

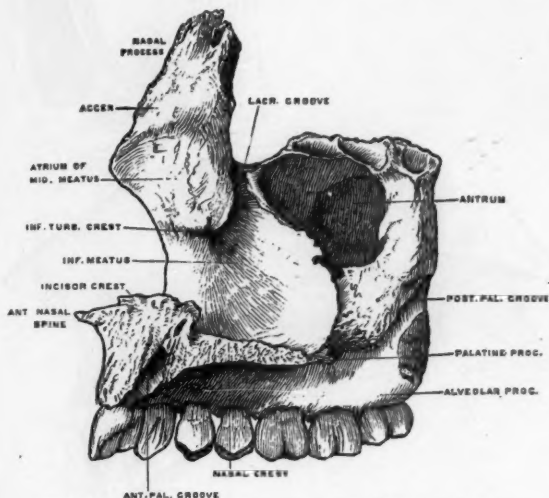


Fig. XIV.—Right superior maxillary bone; inner view.—Quain.

terminal part of the unciform process. The ostium is hidden under the lip of the hiatus semilunaris.

The inferior triangles corresponds to the inferior meatus. Anteriorly a bit of the nasal process of the superior maxilla comes into this region. Posteriorly a little of the palate bone, and between these two the thin process of the inferior turbinate, which hooks the turbinate into place. In order to enter the antrum by the inferior meatus the puncture should be made at least 2 c. c. ($\frac{3}{4}$ inch) back of the nasal spine, in order to avoid the danger, or rather the annoyance of missing the antrum and coming out in

the cheek in the canine fossa. Higher up in this triangle the lachrymal duct makes a marked swelling.

If the antrum is opened from the canine fossa and the upper part of its inner wall along the line of the junction of the inner wall and the roof of the antrum is examined, the following structures are found: The first quarter of an inch of the wall makes the outer boundary of the lachrymal canal. The position of the canal is gen-

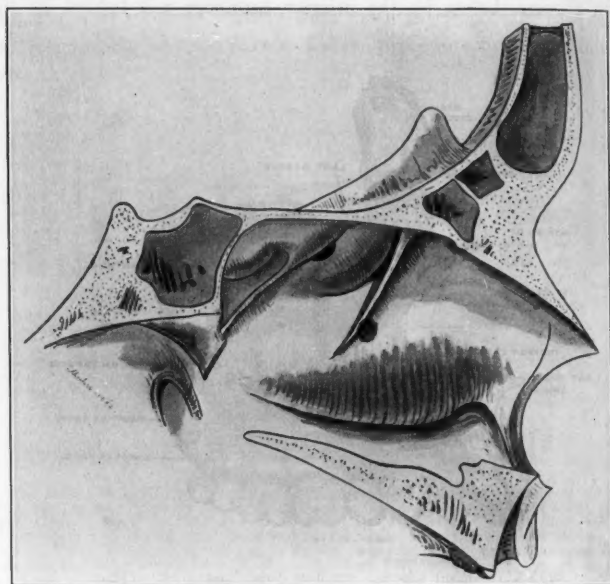


Fig. XV.—Showing the hiatus semilunaris, the ostium and the ethmoid bulla.—Mosher.

erally indicated by a swelling. Just internal to this, or, if there is no swelling present, three-eighths to one-half an inch from the surface, the ostium is placed. One-half of an inch in, however, will usually clear the lachrymal canal. Beyond the ostium the upper part of the inner wall of the antrum is almost entirely membranous, except for the paper-like process of the ethmoid (the uncinata), which projects downward and strengthens it. A knife, therefore, entered at the ostium, inclined toward the horizontal

as much as the opening in the canine fossa permits, and carried directly backward, would cut only the membranous part of the wall, except, of course, this unimportant process of the ethmoid, and would bring up against the maxillary process of the palate bone. In most cases this is extremely thin, so that the knife would penetrate this and be stopped by the ascending process of the palate where it lies against the posterior inner angle

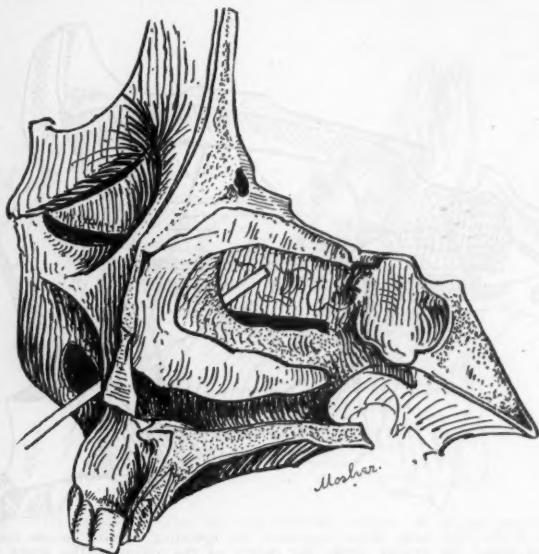


Fig. XVI.—Shows the method of reaching the ethmoid cells from the antrum and the incision in the upper part of its inner wall through which this is accomplished. The anterior end of the incision is at the point where the probe entered. (This corresponds to the ostium.) The crescentic line in front of this is the anterior border of the hiatus semilunaris. From the probe horizontally backward the heavy black line is the incision through which the cells have been reached. Above this the drawing shows how the middle and posterior ethmoid cells have been cleared away, and farther back shows how the front wall of the sphenoidal sinus has been broken down.

of the superior maxilla, like one finger against another, and strengthens it. The lachrymal canal is entirely out of relation to the incision. The incision so made is about one-half of an inch long. No vessels of any size are cut. The inner wall of the antrum hangs like a curtain from the lower part of the inner angle of the orbit. The knife shaves it off much as the mesentery is cut from the small bowel. For practical purposes the inner wall of the antrum can

be regarded as made up much the same as it is in the disarticulated bone, that is, the first quarter of an inch is the outer boundary of the lachrymal canal; then comes the ostium, next one-half inch of membrane, and finally, for three-eighths of an inch, bone again.

A curette entered through the ostium, inclined toward the septum, and carried back in this incision would strike, first, the ethmoid bulla with the rest of the anterior ethmoid cells, then the posterior

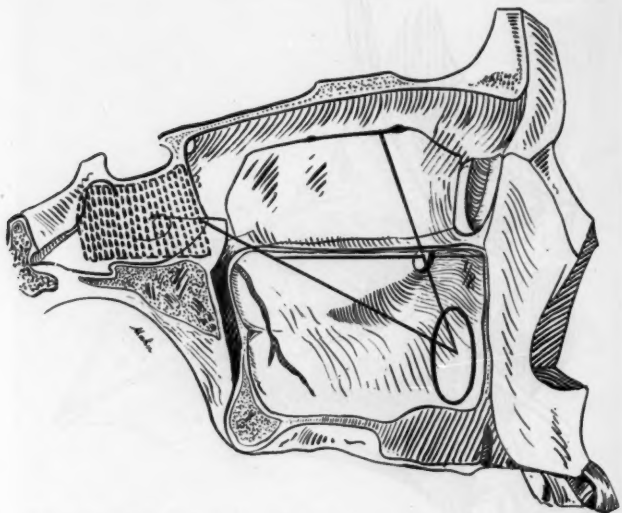


Fig. XVII.—The large circle represents the operating opening in the center of the canine fossa; the smaller circle, the ostium of the antrum. The artery in the posterior part of the inner wall of the antrum is the descending branch of the outer branch of the naso-palatine artery. The posterior line drawn from the center of the canine fossa backward represents the distance to the lower border of the anterior face of the sphenoid. The anterior line from the center of the canine fossa passes up through the ostium to the cribriform plate.—Mosher.

cells, and, finally, the anterior wall of the sphenoid. The ethmoid parallelogram is opened from its lower outer angle, and the cells can be removed by working upward and inward, toward the septum and away from the orbit. The height of the working space is the height of the os planum of the ethmoid minus the notch made in the upper wall of the ethmoid parallelogram by the dipping downward of the olfactory groove. This leaves the working space about one-half inch.

Furet abandoned the inner posterior superior angle, where the antrum prolongation of the sphenoidal so often occurs, angle of the antrum as the site for approaching the sphenoid and advised the use of the inner wall. Jansen, some years before, had practiced the same procedure. Furet resects a large part of the inner wall so that he can, by means of a head mirror and good hemostasis, get a view of the anterior face of the sphenoid and the upper part of the choanæ. The sphenoid in this place is very friable, and both sinuses can be opened from here.

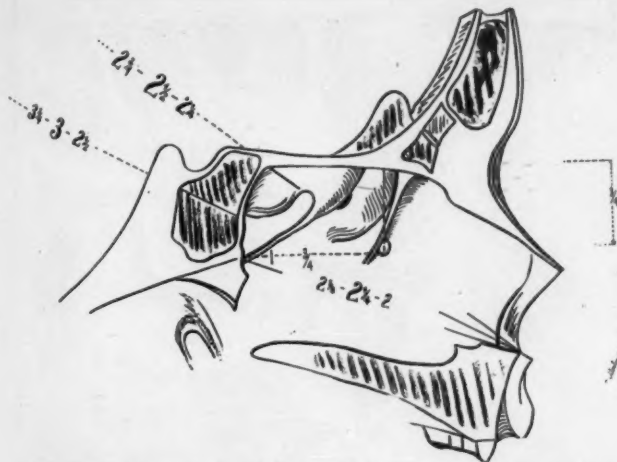


Fig. XVIII.—Figure showing the outer wall of the nose and giving operating measurements.—Mosher.

In opening the sphenoid a finger introduced through the mouth into the posterior nares, as advised by St. Clair Thompson, is an additional guide to the lower edge of the anterior surface.

Today we have small electric lamps which can be placed in the antrum to help out the illumination and adrenalin chloride to perfect the hemostasis. Proper retractors for the upper lip are equally important.

I have measured 50 half heads in order to get an idea of the operating distances to the cribriform plate and to the sphenoid. The first measurement is the distance from the centre of the canine fossa back through the posterior part of the membranous area of the inner wall of the antrum to the lower border of the anterior

face of the sphenoid. This is a line through the posterior end of the incision, which was made from the ostium backward. This measurement varied from one inch and a half to two inches. Generally it was two inches (5 c. c.) The angle at which the curette should be carried backward in order to strike this point is 45° . If the curette is not held parallel to the septum there is danger of opening the orbit posteriorly, not otherwise. The distance straight up through the ostium to the cribriform plate ranged be-

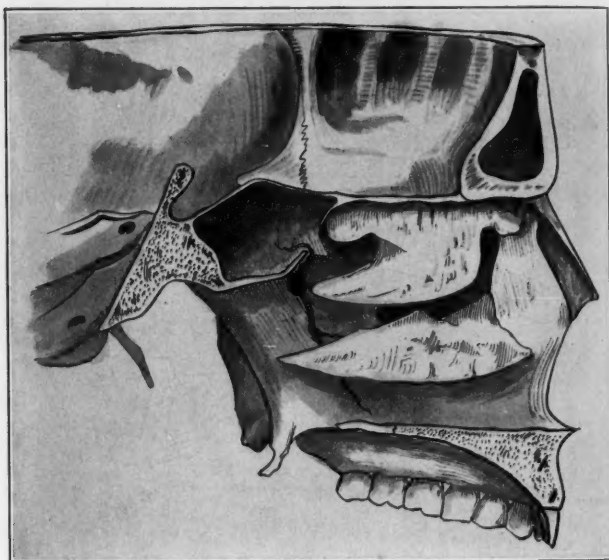


Fig. XIX.—Figure showing the sphenopalatine foramen and the branches of the sphenopalatine artery to the sphenoidal sinus and to the antrum.

tween one inch and a half and one inch and seven-eighths. It is not safe to curette toward the cribriform plate further than one and a half inches, 38 m. m., or practically 4 c. c.

Turn now to the inside of this inner wall of the antrum, or what is the same thing, to the outer wall of the nares. The distance from the ostium to the cribriform plate is on the average $\frac{3}{4}$ of an inch (2 c. c.) In one case only did I find it a half of an inch. This distance is the working distance of the curette upward. A half an inch, there-

fore, from the ostium upward is the limit of safety. This measurement also ($\frac{3}{4}$ inch, 2 c. c.), the distance from the ostium to the cribriform plate, is roughly the measurement of the anterior face of the sphenoid.

The ostium in a great majority of cases is on a line with the lower edge of the anterior face of the sphenoid. It may be a little above or a little below, but for surgical purposes the line from the ostium backward can serve as a guide to this point.

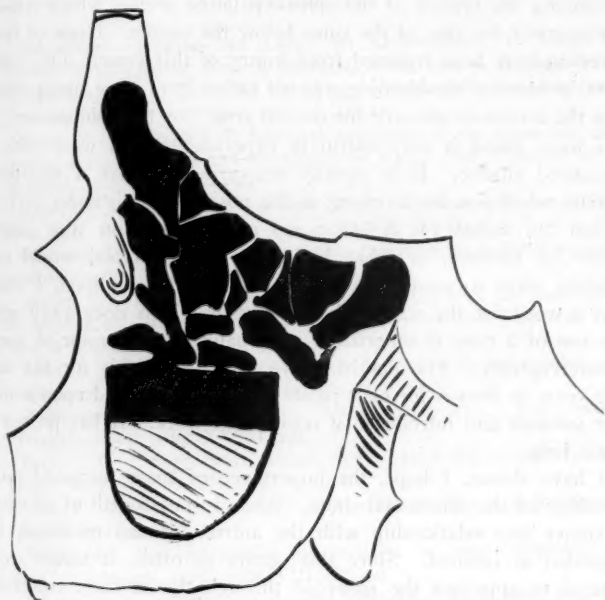


Fig. XX.—Cast of the accessory sinuses and the ethmoid cells, showing how they all focus toward the antrum.—Sieur and Jacob.

The only vessel which is in danger of being cut in this incision through the membranous area of the inner wall is the outer and descending branch of the sphenopalatine artery. This, however, runs down on the ascending process of the palate bone and is not in danger if the incision is stopped a quarter of an inch in front of the posterior angle of the antrum, or if the incision is not prolonged beyond the natural stopping place caused by the resistance

this process gives to the knife. Unless the incision is pushed farther back the pheno-palatine ganglion, which is the Gasserian ganglion of the nose, is not in any danger.

The inner wall of the antrum measured between $1\frac{1}{8}$ to $1\frac{1}{2}$ inches (3-4 c. c.)

If the ostium of the antrum should not be found easily, one-half inch (12 m. m.) will, in the majority of cases, clear the swelling of the lachrymal duct. The membranous area varied between one inch and one-half of an inch ($2\frac{1}{2}$ c. c.-4 c. c.) The average measurement was three-quarters of an inch (2 c. c.) I can see no help for wounding the branch of the pheno-palatine artery, which crosses transversely the face of the sinus below the ostium. Cases of fatal bleeding have been reported from injury of this vessel. One wonders, however, if the bleeding was not rather from some larger vessel like the cavernous sinus or the carotid artery, or the ophthalmic.

I have found it very useful in experimenting to work with a measured curette. It is equally reassuring to have a measured curette when you are working in the nose. The distances of $1\frac{1}{2}$, 2 and $2\frac{1}{2}$ inches (4, 5, $6\frac{1}{2}$ c. c.) are marked on the shaft, either by grooves, or what is better, because blood would not obscure them so readily, by slight ferrules. In addition, I must add a word for the warm ether apparatus. This does away with the use of a cone in etherizing, and enables the operator to work uninterruptedly. The dentists have been using this for the last five years in Boston for cleft palate work. I happened upon it this last summer and introduced it into throat work. It has proven a great help.

I have shown, I hope, the importance of these increased relationships of the sphenoidal sinus. When in one-fourth of all cases it comes into relationship with the antrum, it can no longer be regarded as isolated. Since this occurs so often, it would seem natural to approach the sphenoid through the antrum, especially as the inner wall of this offers a large operating space. If this wall is extensively broken down it enables the operator to see the face of the sphenoid. This can be accomplished so well in no other way. Through the nose the lower anterior edge of the face of the sphenoid, measured as I measure, is $2\frac{1}{4}$ inches, and from the middle of the canine fossa, $1\frac{1}{2}$ to 2 inches, or $5\frac{1}{2}$ c. c., and 4 to 5 c. c. According to Sieur and Jacob, this distance measured through the nose, and from the nasal spine, is 7-8 c. c., and measured from the anterior part of the antrum, 5 c. c. The route to the sphenoid by way of the antrum is, therefore, the shortest and

most direct. By it the operator has two guides to the lower edge of the sphenoid, the finger in the mouth at the upper rim of the choanae and the level given by the incision made from the ostium backward through the membranous area. By this route three of the four accessory sinuses of one side can be opened up. The sphenoidal sinus of the opposite side can also be opened and experimentally on the cadaver, in many cases, the frontal sinus.

In combined empyemata of the antrum, the ethmoid region and the sphenoid, I think that this method is the method of choice.

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THE TREATMENT OF ABSCESS OF THE SEPTUM WITH SPECIAL REFERENCE TO THE PREVENTION OF SUBSEQUENT DEFORMITIES.*

BY C. G. COAKLEY, M. D., NEW YORK.

The treatment of an abscess of the septum may be considered under two heads: First, the evacuation of the pus for the relief of the immediate symptoms, such as pain and nasal obstruction. Secondly, the prevention of subsequent deformities. These vary considerably and depend upon the destruction of part or a whole of the cartilaginous septum, the development of new connective tissue between the two layers of muco-perichondrium over the site of the cartilaginous septum and the sinking in of the soft parts over the tip of the nose, owing to lack of proper support.

On looking up the literature of abscess of septum, as contained in the text books, written by American and foreign authors, the reader will find much valuable advice as to treatment under the first heading. The importance of an early evacuation of the pus is stated, and many valuable suggestions are given regarding the subject of drainage to prevent re-accumulation of pus. No writer gives explicit directions, which, if followed, will prevent or minimize the subsequent deformities.

It is hardly necessary to remind the Fellows of this Society that the cartilage of the septum receives its nutrition from the mucous membrane on either side of it, and that, therefore, this portion of the nasal mucous membrane acts as a perichondrium to the cartilage. It has surprised us to note how quickly the cartilage melts away and disappears when pus is formed on each side of the septum between it and the mucous membrane. In one case a male, aged 27, who was first seen six days after a blow on the nose, a bilateral swelling was found just within the vestibule of the nose and after evacuating about two drachms of pus, a perforation of the cartilage of the septum three-quarters of an inch in diameter was detected. In dispensary practice it is not unusual for a patient to present himself with an abscess of the septum anywhere from one to three weeks following the traumatism, and if the abscess is bilateral, there is always a large loss of the cartilaginous septum. If such cases are treated similarly to abscesses in other parts of the body, namely, by incision, evacuation of the pus, washing the cavity with an antiseptic solution and drainage, deformity in some degree will result. Tamponing the anterior part of the nasal cavities opposite the cartilaginous septum, as advocated by some authors, and formerly practiced by the writer, was frequently followed by considerable deformity. On studying the cases we noticed that the septum was unusually thick over the site of the abscess, due to a separation of the two

* Read before the Eastern Section of the American Laryngological, Rhinological and Otolological Society, Boston, February 14th, 1903.

layers of muco-perichondrium. The intervening space was filled in with connective tissue. This broadening of the septum interfered with the respiratory functions of the nose in one or both nasal cavities, and in time a greater or less depression or flattening of the exterior of the nose took place. Believing that this thickening and depression was due to the uneven pressure of the gauze packing, it occurred to me to employ the Simpson tampon to keep the two layers of muco-perichondrium in close juxtaposition during healing and at the same time to help bear the weight of the superimposed soft parts until the newly formed connective tissue was of sufficient density to support them unaided.

An incision is made into the abscess cavity on that side which seems the more soft or fluctuating. The incision is begun opposite the middle of the columna, and as far anterior as possible. It is carried with one sweep down to the floor of the nose. The abscess cavity is irrigated with carbolic solution, 1-100, the head being inclined forward so that the fluid will come out of the anterior nares and not flow through the nasal cavity. Both nasal cavities are then sprayed with a 4 per cent solution of cocain, to which a few drops of adrenalin chloride, 1-1000, have been added.

After waiting five minutes, a cotton-wound applicator is passed into each nasal cavity, back of the posterior border of the abscess cavity, and together they are drawn forward, making pressure against the septum, thus stripping the abscess cavity of any remaining secretion. The nasal cavities are next irrigated with Dobell's solution and a Simpson tampon inserted into each naris. In the case of children and in some adults it may be necessary to trim the tampon to fit the nasal cavity. The tampon inserted into the side on which the incision was made should have its anterior end just posterior to the line of incision into the abscess. If a little antiseptic spray be injected into each naris the tampon will immediately swell and the operator may be sure that they will retain their place. A small piece of gauze may be inserted into the abscess cavity for 24 or 48 hours, if desired, but we have found that if the incision were a good, generous one, say from $\frac{3}{4}$ of an inch to 1 inch in length, gauze drainage is unnecessary. Tampons must be removed every 24 hours and fresh ones inserted for about a week. The nasal cavity is sprayed with cocain and adrenalin each time and also irrigated with an antiseptic solution. At the end of a week some form of hollow nasal splint may be substituted for the Simpson tampons, for while wearing the tampon the patient must necessarily be a mouth-breather. The splint which we have most frequently employed is the non-perforated Kyle splint on account of the ease with which it can be moulded to the peculiarities of each case. It is advisable to wear the splints for three weeks, at the end of which the connective tissue will be well organized, the septum of normal thickness, and having a rigidity that very closely approximates that of the normal cartilaginous septum.

49 W. 58th St.

THE COLD SNARE IN TONSILLOTOMY, WITH EXHIBITION OF INSTRUMENT.

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For the last ten years I have employed the cold snare almost exclusively in the operation for the removal of tonsils, and during this period the instrument has never failed to do perfect work nor have I had the disagreeable occurrence of a single serious hemorrhage. I, therefore, feel that I am justifiable in considering it the ideal instrument for tonsillotomy and feel warranted in bringing this testimony before this Society. The points of excellency I would mention are: Its ease of manipulation, requiring very little space and consequently it is used with great advantage in children where the space is often extremely limited. It glides easily along the side of the tongue and can be placed in position over the tonsil without gagging the patient, in this respect being greatly superior to any tonsillotome I have ever seen. The small wire loop and slender canula is not terrifying in appearance to the nervous child and he will frequently permit its adjustment when the sight of a long and bulky instrument like the tonsillotome will inspire him with such terror as to effectually prevent the operation without force or an anæsthetic; and I am sure we will all admit that every attempt should be made to do the operation without an anæsthetic when the opportunities for a successful operation are equal.

"Only a little wire" is often the magic sentence which procures the desired consent and permits us to perform the operation under the most favorable conditions.

The greatest point of superiority, however, of this instrument is that it is adapted to any tonsil that requires removal. That variety of hard, flattened and half-buried tonsil which no tonsillotome would engage without great difficulty and then with poor result, is very readily removed by the properly constructed snare by the additional use of a small tenaculum to draw the tonsil from its bed into the loop. Of course all adhesions should be divided when possible, but, given an adherent tonsil, the cold snare will do more satisfactory work unaided, except by the tenaculum, and cause less damage to the facial pillows than any other instrument I have tried.

Under local anæsthesia the pain is not severe and as the loop admits of such instantaneous closing, the child is hardly aware of the fact that the operation has begun before it is finished. I have never had one to refuse to have the other tonsil removed in the same manner, although it is my custom to let several days intervene between each operation when possible. The hemorrhage is less than with other instruments I have used, in fact, I have never had occasion to resort to unusual methods to control any case I have used it with. I did, however, see one case, that of a young adult whose tonsil was removed by a friend of mine in which secondary hemorrhage came on, but was controlled by the galvano-cautery and compression

of the carotid in a short time. The method is even better in the adult than the child and I believe is now considered by most of us as the safest, having the galvano-cautery loop, regardless of the variety of tonsil.

I have never encountered a tonsil too hard to be easily severed with this snare.

It is used with as great facility under anæsthesia as other instruments and if perhaps with a little less despatch, with far cleaner results, in most cases bringing away the entire hypertrophied portion with little hemorrhage, a great advantage where adenoids must be removed at the same operation.

I believe that the failure of many operators to get satisfactory results from the use of the cold snare in this operation, is due to their use of an improperly constructed instrument. It is easily seen why some snares are unsatisfactory. The trouble is the canula. The instrument I use is very simple in pattern, strong, light and quickly and surely adjustable. It is known as Dunn's snare, because to Dr. John Dunn of Richmond, Va., is due the credit of giving it the one feature which renders it so particularly useful in this as well as other operations, and that feature is the flattened end of the canula, enabling the operator to adjust and maintain the loop in any position he may desire. It is just the point which renders this snare superior to others I have seen intended for this work. Dr. Dunn's original instrument was designed with a much lighter and shorter handle, than the instrument I am exhibiting to you today and the failure of the lighter handle to stand the necessary strain in several of my earlier operations, induced me to have made a much stronger handle with a larger shank, as seen in this instrument. The sliding bar has also been made much heavier. This modified handle permits of a larger loop and any strain which may be required of it.

The technique of using the instrument is simple. The tonsil is painted over several times with 10% solution of cocaine and a few minutes are allowed for complete anæsthesia. The patient is then given a small tongue depressor and instructed how to hold his own tongue, and I may say that I have rarely encountered one that was old enough to permit an operation without general anæsthesia who could not do this satisfactorily. The loop, which should not be made as large as the tonsil appears, is placed over the tonsil and the gland is tucked into it all around with the tenaculum. The loop is then slightly contracted to test its hold, the tenaculum is dropped and that hand is quickly placed over the one holding the snare and by the combined strength of both hands the loop is closed in one quick movement. This seems a great deal of technique but in reality it requires only a moment, and the patient, unless usually nervous is not disturbed by the necessary manipulation. The patients complain at times of a slight pain radiating to the ear after the operation, but this rapidly subsides, and the healing is almost unexceptionally rapid and uneventful. I am satisfied that a trial of this operation with a proper instrument will convince those who have never used the method that I am not too enthusiastic in its praise.

151 Granby Street.

ALARMING HEMORRHAGE FOLLOWING EXCISION OF TONSILS AND ADENOIDS.

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While the danger of alarming hemorrhage following removal of tonsils and adenoids is mentioned in nearly all text-books, and cases bearing upon the subject are occasionally reported, yet the importance of the subject can not be too forcibly impressed upon the minds of all operators. The following case, the first of its kind in the writer's experience, covering several hundred operations at the Indiana School for Feeble Minded Youths, and in private practice, seems of sufficient interest to warrant report.

R. T., a boy six years of age, fairly well nourished, but suffering from very large tonsils and a moderate amount of adenoid tissue in the vault of the pharynx, was operated at 10 a. m., Jan. 18, 1903, under ether anæsthesia, the tonsils and adenoids being excised in the usual manner (tonsillotome and Gottstein curette). The patient was under the direct observation of the operator for two hours following the operation, but before the end of that time all hemorrhage had ceased and the patient was conscious. Eight hours later a report came from the patient's home saying that the patient was very restless, breathing badly and had just vomited a great quantity of blood. On arriving at the house the patient was found to be very pale, with pulse 140, and breathing irregular. A hasty examination of the throat showed that a well organized clot covered each tonsil and that no hemorrhage was trickling down from the naso-pharynx. As a precautionary measure, however, a 1 to 3000 adrenalin solution was thoroughly sprayed into the throat and nose. In addition to this about one-half pint of normal saline solution was injected per rectum, and though only a portion of the quantity was retained, yet it was sufficient to increase the blood pressure and slightly improve the general condition of the patient. Soon after this Dr. V. Van Sweringen, who had been telephoned to bring the apparatus for transfusion, arrived, and a pint of normal saline solution was given by hypodermoclysis. Fearing a possible return of the hemorrhage as a result of the increased blood pressure brought about by the saline injection, repeated and careful examination of the throat was made during a couple of hours following the injection, but at each examination the

throat was found dry and free from hemorrhage. The general condition continued to slowly improve, and at 1 a. m. the pulse was 120, respirations regular, and patient quiet. At this hour Dr. Sweringen and the writer, both of whom had been requested to remain in the house until morning, retired for a little rest, leaving instructions to be called at once in case of change for the worse in the condition of the patient. We were not disturbed until 5:30 a. m., when we were told that the patient had slept continuously since 2 a. m., but was now very restless and could not be aroused to take the fluid nourishment, which we had ordered. Upon examining the patient we were astounded to find him unconscious, the breathing very irregular and shallow, temperature 106, and pulse too fast to be accurately counted. The patient was clearly in a dying condition and yet we could not for the moment account for the changed condition. An examination of the throat disclosed no fresh hemorrhage, and the child had not vomited since early the previous evening. Hypodermics of strychnine and whiskey, and saline injections, supplemented by cold sponging brought the pulse and temperature down slowly, and four hours later the patient was conscious, temperature 102, pulse 130, and taking nourishment. From this time on the recovery was uneventful, the patient gaining strength every day until the eighth day following the operation, when he was allowed to be dressed and to play about the house. Fortunately the parents of the child appreciate the great benefit derived from the operation, as evidenced by the free and easy respiration and improved voice, and look upon our experience as one of the complications which occasionally follow any operative interference.

The writer is satisfied that secondary hemorrhage came on anywhere from three to five hours after the operation, while the child was asleep, and that all of the blood was swallowed. Probably the hemorrhage had ceased just before the vomiting, or about that time, as a result of collapse of the depleted vessels and clot, for soon afterwards, when the writer arrived, the throat appeared entirely free of hemorrhage and remained so for some hours or up to the time when the child was left in the care of the nurses (members of family) and the physicians retired. The alarming condition found at 5:30 a. m. can only be accounted for on the ground that the gradually increasing blood pressure, following the saline injection, eventually reopened the vessels that had been bleeding and renewed the hemorrhage, the blood being swallowed as in the first hemorrhage. This hemorrhage must have ceased from collapse of

the vessels before 5:30 a. m., when we were called, for at that time the throat appeared perfectly dry and remained so ever afterward. While we were not able to discover demorrhage, and the child vomited no blood, yet we can account for the collapse on no other ground; for with the saline injection and the nourishment the patient, if not bleeding, ought to have been gaining every hour. The very high temperature bears a resemblance to the high temperature which frequently comes on just prior to death, and is thought to have been of that kind.

The experience has not been without its lesson. The writer, in common with many other operators, had looked upon secondary hemorrhage from excision of tonsils and adenoids as of comparatively rare occurrence. He is now convinced that it is very much in the line of possibility, and therefore every operated case should be within easy reach of the operator, and in the charge of a competent trained nurse for at least two days following the operation. Unless carefully watched a child may be swallowing blood for hours before the hemorrhage is detected. A competent nurse would discover the trouble early through change in the pulse rate, for the pulse is a sure indicator of disturbance in the circulation.

If used intelligently the writer believes that adrenalin solution will check all ordinary hemorrhage following tonsil and adenoid operations, but failing in that the tonsils should be compressed, or the post nasal space packed, as the source of hemorrhage may indicate.

In the case here detailed it is believed that it was an error in judgment not to take the precaution to pack the post-nasal space before or immediately after the hypodermoclysis, as it is thought that the second hemorrhage, caused by the raising of the blood pressure, came from that region, even though there was nothing definite to point to such conclusion. Under similar circumstances transfusion or saline injection would not be given without knowing that all bleeding points were under control by ligature, clamp or packing.

THE HYPERTROPHIED FAUCIAL TONSIL. WITH A REPORT OF THE MORBID HISTOLOGY OF THE SO-CALLED SUBMERGED TONSIL.

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In presenting a paper on hypertrophy of the faucial tonsil, I am fully aware that I am dealing with a subject with which all of you are familiar, and upon which much has been written, therefore it would be entirely out of place for me to consume valuable time in going into details. I shall not consider the etiology, symptomatology, diagnosis or prognosis, but would call your attention for a few moments to its pathology and treatment. In considering the former, I shall confine myself more particularly to the pathology of the so-called submerged form.

As we all know, there are two distinct forms of hypertrophy of the tonsils, characterized generally by the term "hard" (fibrous) and "soft" (adenoid). Shurly's modification of Knight's division is very complete. He divides the subject into four classes:

1—Those very much increased in size, of globular or lobular shape, free, and hard to the touch.

2—Those which are flat, elongated and amalgamated more or less with the neighboring glands.

3—Those which are adherent more or less to the boundaries of the tonsillar triangular space.

4—The enlarged soft tonsil, either free or adherent, flat, globular or lobulated.

In the third class would come the so-called submerged form as described by Pyncheon.

In this condition, notwithstanding a general fullness of the throat, no distinct tonsillar enlargement can be seen. Closer inspection, however, will reveal the true condition. In some cases the faucial pillars are greatly enlarged, causing an even lateral fullness with the tonsillar thickening. In others, the enlarged tonsil is hidden by the plica triangularis, which sometimes extends downward and backward from the margin of the anterior pillar. In fact the two pillars and tonsil on either side constitute an agglutinated, hypertrophied mass; the anterior pillar being generally adherent to the

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tonsil. A microscopic examination of a number of specimens furnished me by Dr. Pynchon showed that the pathological histology of the submerged form did not differ markedly from the other forms of tonsillar hypertrophy, only that the "hard" fibrous predominated over the "soft" adenoid variety, and there was an even greater increase of connective tissue. It formed broad bands throughout the gland, leaving little islands of lymphoid cells scattered through it, and in some cases forming large numbers of well defined alveoli containing lymphoid cells, causing the specimen to assume the appearance of a scirrhus carcinoma, the lymphoid cells taking the place of the epithelial cells. The blood vessels in the connective tissue are much larger than those seen in the normal condition. The laminated epithelial covering is a good deal thickened. Beneath the epithelium the mucosa is seen to be increased by the extra development of lymphatic cells, some of which in places insinuate themselves between the epithelial cells. The acinous mucous glands naturally present in the tonsil had disappeared in the majority of specimens examined.

As regards treatment it is pretty well conceded that the application of medicines is of little benefit, and practically a waste of valuable time. Surgical treatment, therefore, is the only rational one and should be adopted in the majority of cases. In the extirpation of a hypertrophied tonsil, the surgical technic will necessarily vary according to the size and nature of the hypertrophy. Again, each operator has his favorite method of operating and the method that he follows, and the instruments that he uses, while giving him excellent results, will perhaps, in the hands of his colleague, prove very unsatisfactory.

In all cases before operating the throat should be thoroughly cleansed by the use of an alkaline spray or disinfectant throat-wash, and it is best when a general anæsthetic is not used, to paint the tonsils freely with a 15% solution of cocaine or eucaine.

For performing tonsillotomy many varieties of tonsillotome are in the market. The simpler their construction the better. Many surgeons prefer the knife, the cold wire snare or the galvano-cautery snare. If the tonsil is irregular or lobulated to such an extent that it is impossible to engage it in the fenestra or the tonsillotome or surround it with the wire, a curved blunted pointed bistoury can be used, care being taken not to cut too deep.

The galvano-cautery loop possesses the advantage of lessening the tendency to hemorrhage and according to Loeb its destructive action on germ life is a point to be considered. In the removal

of the submerged form, as practiced in a large number of cases by Pyncheon, of Chicago, all the work is done with specially devised electrodes heated to a white heat. In this operation the entire tonsil is not generally removed at one sitting, only the upper half is dissected out the first time, the lower half being left for a future operation, a space of ten days to two weeks elapsing between the two, although with a very tolerant throat, the entire tonsil can be removed at one sitting. It might be thought so free a use of the electro-cautery would insure cicatricial contractions, but the operator claims that such is not the case and that the eventual result is to leave the parts of normal form and character. The writer has seen several cases operated on by the above method and in each the results were entirely satisfactory. The originator of this method also employs the same procedure in removing tonsils partially submerged and for the separation of tonsillar adhesions of the pillars prior to an ordinary tonsillotomy.

Ignipuncture and electrolysis are applicable in certain cases, the former whenever for any reason the danger of hemorrhage may be suspected as in hemophilia. Ignipuncture should cover several sittings and should be applied to one side only at a seance. The cautery knife should be at a white heat and should be made to enter the tonsil preferably between two crypts and held there for a few seconds. It is then withdrawn, and after an interval of a minute or a couple of minutes another puncture in another part of the tonsil may be made. If the tonsil be very large, four or five such punctures may be made at a sitting, without danger of creating too much reactionary inflammation.

Electrolysis is adapted to cases where the hypertrophied tonsil seems to be amalgamated with hypertrophied lingual and neighboring lymphatic tissues, although electro-cautery dissection would seem to be preferable in most of these cases. Any galvanic battery giving sufficient electro-motive force can be used for the purpose. Generally it is better to keep the needles inserted for about five minutes, or even ten minutes in very hard tonsils, until there appears the characteristic whiteness and ebullition in the neighborhood of the cathode.

As previously brought out, the greatest danger from tonsillotomy by cutting is hemorrhage, which is more liable to occur in cutting the "hard" tonsils, because the coats of the vessel are apt to be sclerotic. Dr. Jonathan Wright tabulated some forty cases of alarming hemorrhage, which he found on record in the library of the Surgeon General's office, among which two cases proved fatal.

Delavan, however, in the literature covering a period of six years, found only twelve cases reported of alarming hemorrhage following tonsillotomy. In a series of cases collected by Désiré,¹ probably aggregating 20,000 tonsillotomies, but nine instances are recorded in which severe bleeding took place. In none of these cases was it fatal and in several it was not serious.

Mackenzie² states that he only once met with a case in which the bleeding appeared actually to endanger life.

Velpeau³ has reported four cases in which the internal carotid was laid open whilst a portion of the tonsil was being cut away with a bistoury.

Bishop⁴ reports one case of severe hemorrhage occurring in his practice.

As a result of this brief consideration of the hypertrophied faucial tonsil, we are justified in arriving at the following conclusions:

1st.—That the surgical treatment is the only form of treatment yielding satisfactory results;

2nd.—That no one method is applicable to all cases;

3rd.—That the danger from hemorrhage is so slight it should not deter us from taking operative steps in all cases where they are indicated.

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² Mackenzie: "Diseases of the Pharynx, Larynx and Trachea," 1880, p. 54.

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⁴ Bishop: "Diseases of the Ear, Nose and Throat," 1899, p. 411.

The Effect of Climate on Laryngeal Tuberculosis, with Special Reference to High Altitudes.—ROBERT LEVY, Denver—*N. Y. Med. Journal*, Nov., 1902.

The author's conclusions are based upon a critical examination of his records, and are as follows:

1. That in cases in which both lung and throat lesion develop in Colorado, the throat lesion manifests itself 48 weeks later than in those originating elsewhere.

2. That in cases in which lung lesions develop elsewhere and throat lesion in Colorado, the throat lesion manifests itself 62.3 weeks later than in those originating elsewhere.

It seems, therefore, that the development of laryngeal tuberculosis is retarded (though it may occur in the higher altitudes.

M. D. LEDERMAN.

A NEW MECHANICAL SAW FOR INTRA-NASAL OPERATIONS.

BY EDWIN PYNCHON, M. D., CHICAGO, ILL.

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Septal deformities in adults are the most prolific causes of nasal occlusion and for their correction rhinologists have found the saw to be the most useful and most frequently called for instrument, particularly when the most common form of septal deformity is present, viz.: the so-called spur or ridge or the thickened convexity of a deflected septum. Usually these growths are of moderate size, and within easy reach, so their removal with a good hand saw is easily accomplished, but when a ridge or thickening of the septum is either high up or very far back the difficulty of operating with the hand saw is materially increased, particularly when the growth is so far back that a very short stroke of the saw has to be employed. In such cases, or when a ridge is of large size, a well constructed mechanical saw should possess a material advantage over the hand saw.

After a considerable study of saws of this class heretofore made I have had one constructed which I believe possesses some advantages over its predecessors. The handle, instead of being at right angles with the saw blade, is at an angle of about 60° thereto, as is common with nasal hand saws. It is furthermore reinforced by a ring for the forefinger, which increases the solidity with which it is held. A handle at right angles to the saw blade is awkward to hold and either causes the operator's hand to touch the patient's chin or else requires the employment of a saw blade of extra length. In my saw the handle is attached to the mechanism box at a point between where the power is received and where the saws are attached, which gives greater steadiness than when attached as usual at the former location.

As I wished to attach the saw to my flexible shafting at the same point where I use my hand piece, I have provided for this attachment at the side of the transforming box by the application of a slip joint ferrule, thus copying after the device of Roe,¹ though I find the short piece of super flexible shafting, known to dentists as a flexible wrist piece, which he employs, to be a positive disadvantage, hence I have the saw attached to the more rigid or main flexible shafting, which hangs down from my dental engine. In

of bearing. In this way no ordinary pressure upon the saw will cause it to stop and a nice test can be made by sawing into a cigar box. In fact no mechanical saw is worthy of praise which will not stand such test without stopping. In following the plan of solidity the large size of the reciprocating bar will be noticed. The pitman rod is also heavy, as well as the connecting screws, while the crank pin upon the eccentric wheel is solid therewith, they being jointly one piece of metal.

order to make this attachment I employ an S. S. White Dental Co.'s slip joint and have the heavier part thereof attached to the end of



Fig. 1. Saw Handle with mechanism exposed, ($\frac{1}{2}$ size.)

the shafting. In this way I have a flexible wrist piece attached directly to my hand piece, which is so essential in the use of burs and trephines, and can quickly change the hand piece for the saw.

The revolving disk in the mechanism box is thus attached directly to the flexible shafting and is provided with a smaller or eccentric wheel set therein, which carries the crank pin. When the revolving head or disk is in the position shown in cut, so the line upon the face thereof points directly to the hole at the rear end of the mechanism box, a screw in the edge of the revolving head is brought directly beneath this hole so it can be operated by the use of a slender screwdriver and when unscrewed two or three turns will

In the shape of the casing and in the method of attaching the saw blades I have patterned after the device of Black² and likewise with the saw blades, except that I have given them a bend as recommended by Roe, so the cutting edge of the saw blade is on a line above the mechanism box, thereby allowing the operator to at all times see what is being done. Black recommends coarse teeth, twenty to the inch, though his saw as sold contains only sixteen to the inch. In the cut of my saw blades is shown one of sixteen to the inch and two of twenty-eight to the inch. I find the coarse toothed saw works better on cartilagenous growths, while in case of the harder or more bony growths, which occur far back on the septum, I find the saw blade with more teeth to the inch works better. My teeth are on the cross cut plan, as recommended by Bosworth, and as employed by Black. With my saw blades, one of

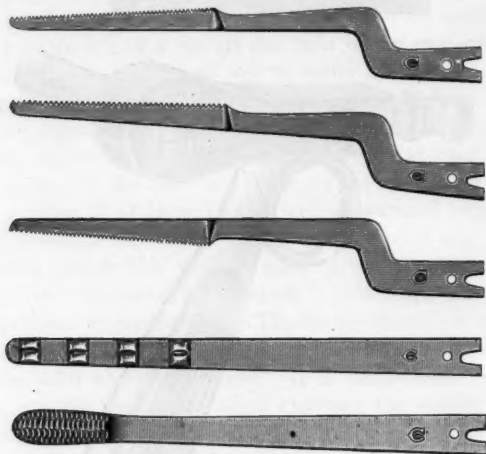


Fig. 2. Saw Blades, Masseur and Rasp, ($\frac{1}{2}$ size.)

which cuts downward, are shown two extra pieces. The first is a masseur, for use in atrophic rhinitis, and is to be first wrapped with cotton and next suitably medicated, as with iodo-glycerine. The slit engage in said hole so the revolving head is made fixed. At the same time through the elevation of the screw the smaller or eccentric wheel is unlocked, so it can be revolved. When stopped at one of the four points shown, and fastened by operating the screw, a stroke of either $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$ or $\frac{1}{2}$ inch is given. As shown in the cut the $\frac{1}{4}$ inch stroke is being used. The change of length of stroke is thus quickly and easily secured.

Aside from its increased solidity, as compared with other mechanical saws heretofore made, the one pronounced feature wherein my saw differs from all its predecessors is in the much greater length of bearing given to the reciprocating bar, and the fact that the pitman pin is attached to this bar at a point between the limits

along the center is for the introduction of a knife blade in order to remove the cotton. The other piece is a rasp, for removing any roughness remaining after the operating of a ridge, or if desired to cause a slight depression of the traumatic surface.

An objection may be made to my saw that it is heavier than necessary. Such objection would be immaterial as a difference of a few ounces one way or the other is of no importance, and in fact a little extra weight is on the contrary advantageous through its counteracting jar and increasing steadiness.

There are several advantages in the use of a mechanical saw in the removal of ridges of large size or when located far back upon the septum. The operation of such saw is less objectionable to the patient as he does not see the to and fro motion of the handle as when a hand saw is employed; furthermore, the operator can devote his entire attention to guiding the saw and without the use of any particular physical exertion. On the other hand in case of the hand saw, during a long operation, its use becomes positively tiresome. The mechanical saw is more easily guided than is the hand saw and it furthermore has an advantage over the latter in operating those rounding growths upon which a hand saw has such a great tendency to slip, as with the mechanical saw a start can be promptly made.

With the mechanical saw the patient feels less pain, largely because the operation is more quickly done, and the bleeding is correspondingly less, hence there is a diminished loss of cocaine. Furthermore, there is not the call for those uninteresting stops during which the patient is cleansing his nose while the operator, incidentally, is resting and thus preparing himself for a fresh attack. With the mechanical saw the operation is generally completed before the patient has a chance to get sick or faint.

For general work as a saw I find the $\frac{1}{4}$ inch stroke the best, using light pressure, though when a bony growth is very hard the $\frac{1}{8}$ inch stroke is more steady. The longer strokes of $\frac{3}{8}$ and $\frac{1}{2}$ inch are of value with either the rasp or masseur, though in their use the speed of the engine should be moderated. While I have not as yet tried the use of chisels with this device I am sure they can be easily operated thereby, using preferably the shortest stroke.

For the operating of my mechanical saw I have found the Victor dental engine to be ideal, which can be run at five different rates of speed and can, at the will of the operator, be instantly stopped and then started again at the same rate of speed. This engine is also reversible, with the same rates of speed, which is of value in the use of burrs, though in the use of the saw it had better be run only to the right, and generally at a good speed.

My mechanical saw has been neatly constructed for me by Chambers, Inskeep & Co., of Chicago.

Columbus Memorial building.

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¹ Transactions Am. Laryng. Assn., 1888, p. 204.

² *The Laryngoscope*, Nov., 1897, III, p. 314.

A NEW POST-NASAL APPLICATOR.

BY J. C. BUCKWALTER, M. D., ST. LOUIS, MO.

I here present a cut of a post-nasal applicator which I devised over a year ago, and have been using with satisfaction in my work ever since.

The cut as shown is one-third the actual size—the instrument being $8\frac{1}{2}$ inches in length.

Some of my friends who are using the applicator speak well of it, and after their suggestion I am induced to offer a description of same.

The advantage of the drop curve is evident, as it allows space for the uvula and soft palate, so the application can be made high



up in the vault of the pharynx. The lymphoid structures can be massaged, scrubbed, polished, without irritation to the uvula and soft palate.

In making an application it usually is better to introduce the curved end in a lateral plane until the post-pharyngeal wall is reached; then by a one-quarter turn upwards the application is made to the desired space.

The instrument is made by Blee-Moore Instrument Co., St. Louis.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Stated Meeting, January 28, 1903.

WALTER F. CHAPPEL, M. D., Chairman.

Growth of the Tonsil.

DR. HARMAN SMITH presented a patient with a bluish colored tumor of the right tonsil, about the size of a cherry. There was no pulsation, and the question arose whether same was connected with a blood vessel. No subjective symptoms were observed. The young man complained of no local annoyance.

DR. FRANCIS J. QUINLAN was interested in noting the peculiar striation seen upon the surface of the tumor, which he thought was cystic. He had seen similar cases of so-called angiomatous growth and was much impressed with their appearance. Some straw colored fluid was withdrawn and the diagnosis of cyst verified. He did not believe any danger would be encountered in puncturing this tumor. The tunic of this mass was hard and somewhat resistant. Angiomatous masses do not have, as a rule, such thickened and fibrous sheaths.

DR. EMIL MAYER said that the case presented had the appearance of what Mickulicz describes as a varix. He could not accept the diagnosis of angioma, for to him the last named was a mass of tissue in which blood vessels were abundant and not as in this instance, a single vessel dilated.

DR. JONATHAN WRIGHT did not know the difference, as laid down in the books, between a varix and angioma, both being vascular growths. He believed it might be said that a varix was a growth that did not form a discrete tumor while an angioma was a discrete tumor of any hyperplasia of tissue containing many large blood vessels. He said that all such growths shade off into each other. He doubted very much whether a growth of that color could be due to the contents of the crypts which had been closed. He had seen such cysts having rather dark appearances, but which shaded off into yellow, but he thought that Dr. Quin-

lan's suggestion might be correct. He had seen angiomatous growths of this kind at the base of the tongue which was entirely too large to be called varices. The appearances which shade off between varices and normal veins at the base of the tongue are frequent.

Congenital Atresia of the Posterior Nares.

DR. MACKENTY presented this case. The patient, a male of 17 years, student, came under observation on December 15. 1902. Past history showed obstruction from birth. The examination presented a deviation of the septum to the right with a sessile echondrosis covering its extent on the right, filling the right nasal cavity from the middle turbinated bone to the floor of the nose and from the anterior part of the triangular cartilage to within half an inch of the posterior nares. There was apparent absence of the turbinates on this side. The mucous membrane was pale throughout, but not much atrophied. The posterior nares were completely occluded on both sides. The left occlusion was composed of a bony rim with a membranous centre. The right occlusion was bony in its whole extent. The naso-pharynx was much increased in its antero-posterior direction, shallow in its perpendicular and about normal in its transverse directions. The pharynx and naso-pharynx were covered with dried secretion and scabs underneath which the mucous membrane was atrophic. The worst points of atrophy were over the Eustachian prominences. There was a discharge from and deafness in the right ear, extending over a period of two years. After a preliminary treatment of ten days the left side was operated upon. A hole was made through the membranous portion of the obstruction which was then split from the floor of the nares to the junction of the sphenoid with the vomer. The wall was then removed with a pair of punch forceps (punch on upright) introduced through the nose and guided by the finger in the naso-pharynx. With a sharp curette the vomer was thinned down. A space was made large enough to introduce the tip of the index finger. The patient now breathes freely through this side (one month after operation). The other side will be operated upon at once. The procedure will be to saw away the echondrosis and later remove the obstructing wall with a drill in all directions as far as is safe. The points Dr. Mackenty would urge are that the septum be not broken up and that the posterior openings be made large enough to allow for shrinkage in healing.

DR. EMIL MAYER said that this was an unusual case in that there was a complete posterior obstruction associated with a deviation of the cartilaginous and bony septum on one side. A somewhat

similar case had been reported in the New York Eye and Ear Infirmary reports some years ago by Dr. Morris J. Asch. In this case there was a posterior obstruction only, which consisted of a bony plate. This was subsequently removed by operation. In the present case the left side has been thoroughly cleared. On the right, there is the deviation of the bony and cartilaginous septum and behind that a membrane. It will be necessary to perform an operation for the relief of the deviation first, and subsequently remove the membrane.

Neoplasm of the Naso-Pharynx.

DR. THOMAS J. HARRIS presented this patient, with a neoplasm in the naso-pharynx which he had failed to remove by the usual methods. At the last meeting of the Section a case of hard fibroma of the naso-pharynx was presented and the difficulties of its removal described. This was a most interesting case and one of the most difficult of operations to perform. The boy presented was 15 years old and was brought to the clinic with no idea as to what his trouble was, the mother suspecting adenoids, because other of her children had suffered from them. No symptoms were presented except a nasal stenosis on the right side of the nose. There was no bleeding, no pain or other symptom except this stenosis, which caused mouth-breathing and a peculiar expression. The growth was largely about the right side of the naso-pharynx and was between the size of a robbin's and a hen's egg, bleeding easily upon touch. It was quite soft. Attachment to the inferior turbinate can be made out. The occlusion upon the right side can be determined by anterior rhinoscopy. Cocain had no effect in removing the sensibility of the part. Last Friday he endeavored to place around it a cold wire snare, but he could not engage the growth; he could not keep the wire on. He made three attempts and then desisted. On Monday the patient presented himself with a follicular tonsillitis and today the tonsils have almost cleared up. He presented the condition as being probably of fibromatous nature, not very hard, and similar to the case reported by Holmes, which he called a naso-pharyngeal fibroma. Histologically there were found elements of nasal mucus membrane.

The method he intended to employ for removal of this growth was suggested to him by Dr. Coffin. A soft rubber catheter or bougie would be introduced through the nares, having threaded to it a strong silk thread, bring it out through the mouth and attach to it the wire. It would be brought forwards and held in position, bringing it out over the end of the wire. The first passes

over the growth, the second under the growth. The wire is adjusted according to the dimensions of the tumor in the nasopharynx of the patient and, with the finger, so manipulated that success follows. One could succeed more readily if the opening of the wire was greater than the width of the finger. If the growth was attached to the inferior turbinate he believed that this method would be successful. It had been suggested to him that success would follow the removal of a portion of the inferior turbinate to which the growth was attached.

DR. JONATHAN WRIGHT thought the attachment of the growth was rather unusual if it was a fibroma. He asked if Dr. Harris had looked up the literature on this subject, and, if so, if he ever learned of such a growth being attached to the inferior turbinate. Large vascular growths, he said, were very frequently attached there. He had seen one instance of angio-fibro-sarcoma attached there. He thought the attachment was so vascular that it might prove to be some vascular growth, with a large amount of fibrous hyperplasia.

DR. J. CLARENCE SHARP suggested to Dr. Harris that he first remove a portion of the inferior turbinate when the snare can be easily introduced. He said the patient's turbinates were much hypertrophied and should be attended to first.

Pistol-shot Wound of Larynx.

DR. FRANCIS J. QUINLAN presented this specimen of a larynx which was injured by a pistol shot wound of the neck. The patient was brought into the hospital late at night and the doctor saw him the next day, when he found a great deal of tumefaction and both cords in bilateral abduction with only a slight elyptical opening between them. A trecheotomy was performed and the man lived one week, obtaining great relief from the operation. He had emphysema, which was very marked after the operation, although there was some evidence of this symptom before. The post-mortem showed the tissue along the path of the bullet much necrosed. In all tracheotomy wounds he wished to emphasize, one thing. Inspiratory efforts were liable to be followed by emphysema. He could recall many cases that were quite pronounced after such an operation. Therefore, he advised packing well around the canula, and arresting as much as possible the inspiratory moments of the larynx. He wished to thank Drs. Walsh and Schultze for the preparation of the specimen.

A New Operating Table.

DR. CHAPPELL presented to the Section a new operating table made for him by Ford. It was for use in operations upon tonsils, adenoids, etc., while the patients were under anæsthesia. It could be packed in a leather case and was easily transportable.

DR. THOMAS J. HARRIS asked the Chairman if he had seen the table devised by French, of Brooklyn. He had first become acquainted with it in the Hospital Bulletin reports. It was for use in operations in which the upright position was to be assumed.

DR. JAMES E. NEWCOMB referred to a table shown him by Dr. Dowd, which had somewhat the same features as the one presented by Dr. Chappell, except that it was more complicated and was for general surgical work. It weighed but 35 pounds and sufficed for any general surgical operation.

The Bacteriology of Pharyngeal Exudates.—DR. WM. HALLOCK PARK, N. Y. (Abstract of Paper.)

Although for most physicians the main interest in the results of the bacteriological examination of cultures from throat exudates is limited to learning whether diphtheria bacilli are present or not, still there is further information to be gained which should be of interest.

The ulcerative exudative inflammation described by Vincent undoubtedly occurs in this vicinity more frequently than most believe. A typical case was described before you recently by Dr. Mayer, with a bacteriological examination by Dr. E. Libman. The clinical interest in these cases arises from their frequently extensive local lesions, their chronic cause and their very moderate constitutional symptoms. The finding in smears made from the exudate of the abundant long spirilla and the fusiform bacilli described by Vincent, while at the same time no diphtheria bacilli appear in the cultures, allows us to make a diagnosis of the disease.

The spirilla are some times absent and other bacteria, such as streptococcus are always present.

It is very possible that the bacilli and spirilla met with in widely separated cases differ somewhat from each other. Our inability to develop them on present media and so to obtain them in pure culture prevents tests of identity being carried out.

So far as I know the inoculation of these spirilla and bacilli on healthy mucous membranes has not produced the disease and it is probable that diseased teeth or some local exciting condition is necessary before infection can take place.

The exudation due to the thrush fungus many not only be found in children but also in adults, appear in the pharynx. In occlusions of the fungus, the oidium albicans have been carried out on slightly abraded mucous membranes and produced the disease.

Cultures are hardly necessary for diagnostic help, as the direct microscopical examination of the exudate reveals the thick interlacing mycelial threads with the attached or free conidia.

Cultures upon sugar media reveal actively budding yeast-like forms.

The pharyngeal exudates occurring either early or late in scarlet fever are usually not due to the diphtheria bacilli. Class, of Chicago, has described a peculiar coccus, which he believes to be the exciting factor in scarlet fever. This has not been accepted by others. My examinations have shown a great increase in streptococci in these cases, but no organisms which can be identified as being different in kind from what occurs in ordinary tonsillitis. I have met with four cases of tertiary syphilis in which the whole of the soft palate and pharynx was covered with an extremely thick, foul membrane. These were all diagnosed by physicians to be malignant diphtheria. The very moderate symptoms along with the absence of diphtheria bacilli disclosed the nature of the cases. They all did well on iodide of potassium, although in two the uvula sloughed off.

In the pharyngeal exudates complicating the various diseases or occurring more rarely, primarily the bacteriological examination reveals as a rule streptococci and other micrococci. When the membrane is clean looking bacilli are often scanty, when it becomes foul or gangrenous they are usually abundant, often appearing like those described by Vincent. Except to disprove diphtheria the results of these examinations give little help in prognosis and treatment.

As to diphtheria itself there is not much new to abate. Cultures made in a proper way from pharyngeal exudates almost always produce a growth of diphtheria bacilli, if they were present in the throat. In about one per cent the first culture fails to reveal them, when a second does. The so-called pseudo-diphtheria bacilli probably has no relation to diphtheria. In a great many trials we have never met with a virulent culture.

Although it is true that there is a non-virulent diphtheria bacillus, which has all the characteristics of the virulent bacillus except toxin production, yet it is so infrequently met with that we can safely rely on the culture test for our treatment of doubtful cases. When in a mild case the bacilli persist a long time in the throat it is well to remember these non-virulent forms and ask for a virulent

test. In severe cases this is not worth while, for the bacilli were certainly virulent at the start and we now know that however long bacilli remains in the throat they retain their original characteristics.

Direct smears from the exudate can be obtained and examined immediately. In about two-thirds of the cases of true diphtheria the bacilli on the slide will be so abundant and characteristic that their identity can be safely decided. As a rule, however, it is safer to wait for cultures.

The use of anti-toxin is not so generally adopted both for immunization and treatment that it is unnecessary to allude to it, except to emphasize the fact that it must be given very early to do great good. In the middle of an attack it is of only moderate value.

Some still ask what difference does it make whether the disease is due to streptococci or to diphtheria bacilli alone or with other bacteria. The statements of others as well as a very wide personal experience, in both private and hospital practice, has absolutely convinced me that, in cases where the larynx is not involved and no complicating disease, such as measles or scarlet fever, exists, there is almost no danger from any pharyngeal exudate in which the diphtheria bacilli have had no part. It is true that in many cases of true diphtheria, the way having been opened by the tissue injury from the diphtheria toxins for the entrance of other bacteria, these may then go on through their poisons to produce even graver injury than the diphtheria bacilli. Even in these cases, however, the diphtheria bacilli are responsible for these later infections.

The non-diphtheretic exudates do not, when transmitted to others, communicate disease, while the exudate from the mildest case of diphtheria may cause in another malignant disease.

It is for this reason that cultures are valuable in light and doubtful cases. Here the knowledge of the presence or absence of the diphtheria bacilli may be of little value in prognosis or treatment, but the knowledge of their presence will enable us to protect others, while the certainty of their absence will allow us to give freedom of intercourse to our patients. The physician must always keep in mind that the laboratory can only detect bacteria, the physician must decide from clinical observation whether the bacteria are exciting disease. The culture cannot in the least estimate the susceptibility of the patient.

DISCUSSION.

DR. HENRY KOPLIK said that physicians, when they see exudates in children suffering from inflammations of the pharynx, tonsils or nares, are confronted with two questions: "Is this diphtheria or

diphtheroid?" Other exudates are comparatively rare in infants and children, although, in his experience, he occasionally met with those of a syphilitic nature. Lupus is comparatively rare in children. Tuberculosis was found in children and, as a rule, caused an exudate and ulcerations similar to what was found in adults in this situation. Mycosis was very rare in infancy and childhood, although occasionally met with. Diphtheroid, he said, was an exudate, the result of the action of the streptococci or staphylococci, or both; he mentioned this in order to define what he meant by the term "diphtheroid." There were no gross clinical appearances of the membrane in the throat which could give one any idea as to its real character, whether diphtheria or diphtheroid. He acknowledged there were certain clinical characteristics of some of the beginning processes which would cause us to have a suspicion of diphtheria, but there were no clinical appearances which would justify us in excluding diphtheria. In other words the use of the culture tube offered the only positive diagnosis between diphtheria and diphtheroid. One should think of diphtheria if the exudate in the throat was situated at the base of the uvula extending over towards the tonsil. If there was isolated swelling of the uvula, with no exudate at the side, there might be diphtheritis membrane behind the organ. If small exudates were seen upon the tip of the uvula, as large as the head of a pin, accompanied by a follicular tonsillitis, if with these there is a foul odor to the breath we could then be more positive as to the diagnosis of diphtheria. Again, there were certain processes present in the throat which would not justify us in making a diagnosis of diphtheria without the use of the culture tube. Ulcerations, similar to those described by Mayer as being due to the Vincent spirillum and bacilli, are sometimes truly diphtheric. If we met with ulcerations upon the tonsil combined with ulcerations of the tongue, with foul odor, we should think of Vincent's ulcerative angina. He did not think that any physician would be justified in taking all this as final. He believed that one should always use the culture tube in these throat cases, in all varieties of exudates. He said that unless a child was exposed to diphtheria and scarletina, 80 per cent of the exudates in the latter affection were diphtheroid in nature. In measles or scarletina the question as to the absence or presence of true diphtheria could only be settled positively by the use of the culture tube.

He did not think we could estimate the exact frequency of lacunar diphtheria, *i. e.*, the exudate resembling simple follicular tonsillitis and remaining so throughout the whole course. The reason for this

was the many physicians seeing a follicular appearance in the throat of a child do not wish to alarm the parents and let the case go as a follicular tonsillitis; later, should the patient develop paralysis, they conclude that it was of diphtheric nature. In such cases the culture tube is rarely used. In epidemics of diphtheria he was surprised to learn of the frequency of lacunar diphtheria. He recently had seen a little fellow with whooping cough who had attacks of tonsillitis, pharyngitis and laryngitis at different times; the tonsillitis was of the follicular form and remained so; it was thought to be of a catarrhal character, but was true diphtheria. In many similar cases he had found diphtheria.

He thought it would interest the Section to relate some experiences of Dr. Caille, which were published some years ago with regard to diphtheria of the fauces following tonsillotomy. The question arose as to how diphtheria came about and it was suggested that, in these enlarged tonsils, the diphtheria bacilli were present; when the tonsil was cut there was left a large raw surface and the bacilli, hitherto inactive and innocuous, started to form a membrane. An attack of diphtheria resulted. Therefore, before operating upon enlarged tonsils, he believed it would save much trouble subsequent to the operation to inquire if the child had had an attack of diphtheria in the near past. If the child had an attack within a period of say six months it would be well to take a culture from the tonsillar crypts and see if any diphtheria bacilli were still present.

DR. HENRY D. CHAPIN related the instance of a girl, three or four years old, who was sent to the hospital this fall. The house doctor was puzzled with regard to the case and asked Dr. Chapin to see her. The child was weak, very pale, and in a low condition, with a very bad breath. Upon examining the throat and mouth a large pseudo-membrane was observed upon the hard palate and extending to the base of the uvula. It did not involve the pillars of the fauces or tonsils. The picture presented was one of a bad septic case of diphtheria. He told the house doctor that he had never seen a case of diphtheria with the membrane situated exclusively in such a place. He refused to admit the child and sent her home. On the following day a doctor was sent to investigate and take a culture, which proved negative; he learned that the child was suffering from phosphorous poisoning, contracted by sucking matches. The child was then admitted to the hospital, and the membrane came off, leaving a necrotic area. Recovery took place.

He took exception to the statement that tonsillitis was rare in infants, for he believed that it was more common than was generally supposed. The reason the disease is not discovered is on account of the difficulties encountered in attempting to examine the fauces in infants under the age of two years. The passages were so small that, unless there be a good light, one would fail to see any exudate. In order to facilitate such examinations he had devised a special tongue depressor for young children, which he described; with this a thorough examination of the tonsils could always be made at the first attempt. It was not the large but the small pin-head points that were to be sought for, which is accompanied by fever and digestive disturbances. It was a self-limited disease and the patients will get well under no treatment.

He spoke of the perplexity caused by the use of the terms diphtheria and diphtheroid. He believed the Klebs-Loeffler bacilli caused diphtheria and the streptococci, diphtheroid. Most of the very bad cases he had seen were from a mixed infection. Death more often followed infection from the streptococci than from the Klebs-Loeffler bacilli alone. He had recently seen a case occurring in a doctor's family. The child had what appeared to be an ordinary cold; examination did not show any exudate in the throat at all. Culture made at first was negative. The second culture was given as probable, and the third showed the bacilli of diphtheria. There was a discharge from the nose and a swelling in the neck. In diphtheria he paid a great deal of attention to swellings in the neck; when this condition exists in great degree your case is apt to result fatally; there are not many exceptions to this rule.

DR. JONATHAN WRIGHT said that no mention had been made of some of the rare appearances which simulated pharyngeal exudates. In certain cases of the grippe an exudation will be seen which baffles the observer for a few days; but this soon passes away. The bullæ of phemphigus and herpes, when they burst and collapse, leave a shining white patch, often of considerable extent, which is merely the detached epithelium which has been raised by the serous exudate beneath it. This rubs off after a while and leaves an excoriation. Seen in either of these conditions, the appearances are easily mistaken for pharyngeal exudates of other origin. Mycosis of the pharynx was said by one of the speakers to be infrequent in children. With this he did not agree.

He thought the sentiments of some of the speakers were calculated to give rise to some confusion as to the diagnosis of diphtheria. A learned bacteriologist had told them that the diphtheria bacillus

frequently existed in normal throats and persisted occasionally indefinitely after an attack of diphtheria. Another eminent speaker had declared that the presence of the bacillus in the tonsillar crypts should give rise to the diagnosis of diphtheria. As a matter of fact, it seemed to him that while the bacillus was of great significance, it was a very unsatisfactory factor on which to base a clinical differentiation of throat inflammations.

DR. M. D. LEDERMAN related a case in which he was much interested on account of the pharyngeal exudate which, clinically, resembled diphtheria of severe form. The bacteriological examination revealed staphylococci. The patient suffered considerably for five or six days, with marked oedema of the soft palate and posterior pillar. All the local symptoms disappeared under the administration of anti-rheumatic remedies. After the local symptoms had subsided almost every joint in the body suffered from an attack of acute articular rheumatism. One tonsil was involved with a distinct membrane which extended from one side to the other.

DR. L. A. COFFIN said that he was particularly pleased to hear from Dr. Park the admissions of the limitations of the bacteriologists in making a definite diagnosis from throat culture. Since the advent of the Klebs-Loeffler bacillus, as clinically we had at times well nigh lost confidence in our ability to diagnose diphtheria. He said: "I have great and renewed confidence in the trained and experienced eye, and there is by that eye conveyed an impression to the brain that it is impossible to reproduce by pen, brush or speech. The report from the bacteriologist should be received by the clinician as an added bit of knowledge which he should incorporate with his clinical picture. It may lend to a diagnosis, it may confirm diagnosis and it may be necessary to throw it out as an element in the diagnosis.

DR. EMIL MAYER said that he wished to make a correction in one of Dr. Park's statements, and that was that there was usually some existing disease condition when the bacillus of Vincent was present. This is not the case.

One point in the discussion was of undoubted value to the profession, and that was as to the length of time patients must be isolated after all symptoms of diphtheria had subsided. The present custom is to take culture every few days, and as long as the bacillus is found the patient is kept isolated. This may and often does last many weeks and is a source of many bitter complaints on the part of our patients and annoyance to ourselves. If some happy medium could be found it would be of incalculable benefit.

In regard to pharyngeal exudates it is well to note their presence after injury, especially after operations, and also after the application of certain drugs. The superarenal extract often occasions a lymph deposit.

He wished to enter a most emphatic protest against the use of cocaine for the examination of young children, in fact for any purpose whatsoever in the very young. The method of examination as proposed by Dr. Chapin was so very simple and satisfactory that no other was necessary:

Perhaps one point more might be dwelt upon, and that was the differential diagnosis between syphilis and the exudate associated with the bacillus of Vincent. This the speaker had emphasized in a paper presented to this Section a year ago.

DR. ROBERT C. MYLES said that when he was in general practice he did not seem to have any difficulty in making a diagnosis of these throat conditions; but since he had begun to specialize the confusion became greater and greater. In country practice diphtheria appeared about once in five or ten years in epidemic form and usually with a death-rate of 25 per cent, and no one had any difficulty in recognizing diphtheria. They often had what they called "homeopathic diphtheria," in which little spots appeared in the throat and all these cases recovered. He asked Dr. Koplik if he had ever seen a case of lacunar diphtheria result in death.

He had never seen a case in which the removal of the tonsils was followed by diphtheria.

DR. HENRY KOPLIK, in answer to Dr. Myles' question, said that he had not seen any such cases of lacunar diphtheria prove fatal, but that was not the point at issue. He intended to impress the fact that persons exposed to diphtheritic infection of a lacunar diphtheria might contract a fatal form of diphtheria.

DR. E. L. MEIERHOF said that at the hospital or dispensary every child who had an exudate had a culture taken, which was sent to the Board of Health; they send as many as 100 tubes a year.

They laid great stress upon the appearance of enlarged glands in these cases. If they appeared at the time of the child's illness it could usually be taken for granted that the Board of Health would report the presence of the Klebs-Loeffler bacilli.

Regarding the discharge from the nose, he said that any child with a red throat, but without any exudate there, who had a discharge from the nose of a muco-purulent character, a culture of that discharge frequently gave evidences of the presence of the Klebs-Loeffler bacilli.

DR. WM. H. PARK stated that he had had little personal experience with Vincent's disease. In saying that it was necessary to have a suitable local soil for the development of the disease, he had meant that it had been noted that carious teeth or a syphilitic inflammation frequently existed previous to the appearance of the exudate. The bacilli and spirilla of Vincent was probably incapable of producing infection in the perfectly normal mouth and throat of a healthy individual. If physicians who met with persons who seemed to have Vincent's exudate had no laboratory accessible he would be very glad to examine smears sent to the Health Department laboratory, on 16th street. Cultures in these cases are useless, the special bacteria of this disease not growing in them. The difference between having diphtheria bacilli present in the throat and having them actively exciting disease seemed hardly to be appreciated by the members who had spoken on this topic.

The examination of the culture tube at the laboratory can only reveal whether diphtheria bacilli are present in it or not. The physician who had made a suitable culture can rely with sufficient certainty for action upon the laboratory report. If the patient is convalescent the report indicates that diphtheria bacilli are present, but not producing disease. If extensive inflammation is present the reports indicate that the bacilli are actively producing their toxins and exciting lesions. If very slight lesions are present, the report indicates that the diphtheria bacilli are taking a minor part and perhaps are not active at all. An experience last winter in an asylum nearly illustrates this point. After two fatal cases of diphtheria the throats of a number of children were found to harbor virulent diphtheria bacilli. All the children were immunized by anti-toxin injections. Several cases of follicular tonsillitis occurred in these immunized children, in some diphtheria bacilli were found, in others none. It is fair to assume that here the diphtheria bacilli because of the recent immunization, were not active. Because of natural immunity similar conditions may arise in children who have not been immunized by anti-toxin.

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All papers marked (*) will be published in abstract in THE LARYNGOSCOPE.
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SELECTED ABSTRACTS.

Progress of Diseases of the Nose—B. A. WADDINGTON, Salem, N. J.—*Medical Age*. October, 1902.

Atrophic Rhinitis.—"The origin of the atrophic form of rhinitis is without question of remote specific diathesis." "The discharge arises from any bony cavity opening into the nose." "The odor varies in proportion to the amount of bone involvement." "Constitutional treatment has no value, the rule being that these patients are in good health."

Deviated Septum.—"Is the result of traumatism in early life." The repeated injuries from falls in early life and from blows in later life, sets up inflammatory changes, resulting in over-development of the septum.

"Nasal polyps belong to the same class as the adenoids, analogous as to tissue."

"Adenoids are confined to children. Their growth is always systemic, a localized tissue metamorphosis."

The statements made by the author are too flagrant to pass unnoticed by the reviewer. Under the title which they have been placed they are neither progressive nor recognized or accepted opinions. The fact that he closes his remarks as follows: "I have not written upon the pathological conditions mentioned in this brochure as a specialist or expert, but from the standpoint of a general practitioner of medicine."—explains the reason of his misguided ignorance of the subjects in hand and excuses him for much he has said.

STEIN.

A Simplified Method of Operating for Deflection of the Cartilaginous Septum.—DUNDAS GRANT—*Journ. of Laryngology*, Sept., 1902.

The method offered is a modification of the Old "Roberts" technique together with the idea suggested by Moure.

1. Cocainizing both sides of the septum.
2. Straightening and transfixing with the needle. (Roberts).
3. Administering nitrous oxide gas.
4. Cutting through the cartilage by means of Moure's shears horizontally below the deflection then obliquely in front of and above it parallel to the ridge of the nose, the incisions not meeting below and in front.
5. Manipulating the cartilage at the incisions, so as to encourage over-riding.

M. D. LEDERMAN.

A Typical Case of Frog-Face produced by Nasal Polypi—J. A.THOMPSON—*Cincinnati Lancet-Clinic*. August, 1902.

A case from which a large number of polypi had been removed, covering a period of sixteen years. At the time of seeing him first the author found both nostrils completely blocked by them. The removal of those in the free cavity of the nose showed others coming from within the ethmoid cells. The author believes that in such cases to effect a complete cure, it is necessary to not only open up and expose the cells, but to follow the case carefully, and repeat the procedure of removing portions of the ethmoid as they become affected. For he thinks that weeks and months afterwards one will find polypi growing from other portions of bone.

STEIN.

Myxomatous Mucous Polypi of the Nose in an Infant—LACOARRET—*Revue Heb. de Laryngologie, D' Otologie et de Rhinologie*. Sept. 13, 1902.

The author gives six new cases of mucous polypi in children. He very properly insists on the rarity of this affection, because in six years and in more than ten thousand cases he has met with only this limited number.

In five cases he found polypi of the ordinary myxomatous type; in the sixth case, a myxofibroma.

The ages in these cases were 10, 12, 6½, 11, 14 and 8½ years respectively.

W. SCHEPPEGRELL.

Pemphigus of Mucous Membrane.—J. CHARLES—*Medical Bulletin*, Dec., 1902.

The author mentions the fundamental element of pemphigus, that which constitute the characteristic of the disease, is the bulla. The diagnosis of this disease is easy when the bullae are unruptured. After the bullae have broken, the lesions may be confounded with herpes and diphtheria. From the latter it may be differentiated from the character of the membrane, absence of glandular enlargement and bacteriological examination. Treatment resolves itself in anti-septic gargles, emollients and inhalations of mentholized vapor. When adhesions of the velum to the post-wall causes obstruction Abellis recommends bougieing through an artificial opening made Avellis recommends bougieing through an artificial opening made

M. D. LEDERMAN.

Some Cases of Spasm of the Glottis and Convulsions in Children cured by Ablation of Adenoid Vegetations.—MAALVE
—*Hospitalstidende*, 1902, No. 29.

M. has employed scraping out of the epipharynx only in such cases in which decided symptoms of adenoid vegetations were present, in all, ten patients, (7 boys and 3 girls) were treated. Seven were less than one year old, and four were suffering from spasm of the glottis only, while in the remaining six, spasms of the glottis was accompanied with convulsions. All were cured. GOTTLIEB KIAER.

Enlarged Lingual Tonsil—FRANK D. BOYD—*New Albany Medical Herald*. September, 1902.

The case reported is of unusual interest in that the patient was very young, only 2 years old, and the whole of the base of the tongue was involved, impinging itself upon the epiglottis, tying it down so completely that it was rendered inactive.

All the symptoms, like vomiting, choking, night sweats, swallowing during sleep, nodding motion of the head, etc., disappeared on the removal of the mass. STEIN.

Salient Points in the Treatment of Catarrhal Deafness.—SARGENT F. SNOW,—*Buffalo Med. Journ.*, Jan. 1903.

The author lays stress upon the necessary operative work within the nose. Mention is also made of constitutional treatment, such as vigorous exercise as a relief of distended blood vessels. The author recommends cold bathing. In summing up it is virtually impossible to successfully handle a case of chronic catarrhal deafness where there is low vitality, a sensitive skin or frequent functional derangements, whereas, without these obstacles a correction of morbid nasal condition makes the disease non-aggressive and capable of much improvement by the persistent camphor and iodine vapor treatment. E. D. LEDERMAN.

The Pathological Conditions of the Cranial Sinuses.—F. S. KIRKLAND, Edinburgh—*Journ. of Laryngology*, Nov., 1902.

The percentage of cases occurring in pneumonia was 45 per cent, consequently the author states that we are justified in assuming that the pneumococcus and its associates are actively instrumental in producing disease of the accessory cavities of the nose.

Hajek has found the pneumococcus present in the antrum of high-moore in conditions of health.

Bronchitis and bronchiectasis are complications of sinus disease, and frequently are kept active, owing to the original disease being overlooked. M. D. L.

Laryngectomy for Malignant Disease.—FRANK HARTLEY, N.Y.
—*N. Y. Med. Journal*, Dec. 13 and 20, 1902.

With earlier diagnosis and more restricted operative procedures the death ratio and the possibility of recurrence can be greatly reduced. The results of numerous surgeons are cited, and the author remarks that today in the class of cases in which partial excision of the soft parts of the larynx has been combined with thyrectomy, the permanent cures are as high as 44 per cent, while the death rate can be placed at about 11 per cent.

This steady improvement in the results is to be found in the measures adopted to avoid the former frequent causes of death, viz.: the aspirative pneumonia and the infection of cellular planes enclosing the trachea and its extension to the mediastina. The avoidance of general anaesthesia and the more frequent employment of local anaesthesia must be considered as an important adjunct to the good results of recent years. Another measure used in total laryngectomy for the avoidance of aspirative pneumonia is that suggested by Glück, in which immediately preceding the extirpation of the larynx, division of the trachea at the level of the first or third rings is made and its lumen turned forward and sutured to the skin. The mortality for this method has been only 8.5 per cent for total laryngectomies, a mortality not yet obtained by any other method.

It is practical before proceeding to any radical method, to explore the interior of the larynx, through a preliminary thyrectomy, to exclude the possibility of a more restricted procedure. This operation is described in detail. For a general anaesthetic chloroform is to be preferred, preceded by a hypodermic injection of atropine: gr. 1-100. The Trendelenburg-Rose posture is recommended. Attention is called to the anatomical and pathological division of the laryngeal planes according to West.

This exhaustive paper, with its aenda of five cases, with their histories, operated upon by the author, is a valuable contribution to the literature of this important subject. It permits us to feel that prompt recognition of malignant disease in the larynx, together with early surgical intervention by a skilled operator, offers more hope for the sufferer than we were inclined to believe from past observations.

M. D. LEDERMAN.

Exploration of the Cerebellum and Drainage of a Cerebellar Abscess during Artificial Respiration—E. W. ROUGHTON.—
Lancet. July 26, 1902.

The reason for calling attention to this case is that the diagnosis of cerebellar abscess is still a matter of difficulty, and the localization is of still greater difficulty. The whole operation was performed during the maintenance of artificial respiration, and the necessity for the performance of the latter was abolished as soon as the abscess was opened. The interesting points of the case are as follows:

1. *The Difficulty of Diagnosis.*—For ten days the patient was under observation, and his only constant symptom was abnormal slowness of the pulse. The headache, mental slowness, deafness, vomiting and tenderness over the mastoid all improved; then vomiting, subnormal temperature, giddiness and increased mental dullness came on.

2. *The Localization of the Abscess.*—The points given by Acland and Ballance, quoted in Jacobson's "Operations of Surgery," are: (1) Paralysis of the upper extremity on the same side; (2) conjugate deviation of the eyes to the opposite side; (3) lateral nystagmus; (4) exaggerated knee-jerk on the side of the lesion; (5) a tendency to face towards the side of the lesion in walking; (6) staggering gait, and a tendency to fall towards the side opposite to the lesion; and (7) attitude in bed, the patient lying on the side opposite to the lesion. Of these different symptoms there were absent in the present case paralysis of the arm, conjugate deviation of the eyes, and lateral nystagmus. The patient was never examined as to his gait. So the only localizing symptoms were: (1) Exaggerated knee-jerk on the left side; and (2) inability to lie on the right side. The former turned out to be accurate, but the latter did not.

3. *The Anesthetic.*—The fact of the pulse-rate increasing from 42 to 120 the author can only explain as due to pressure on the vagus centre, rendering it more easily inhibitable by chloroform than when it is in a normal condition. Whether a different result might have been brought about if no anesthetic had been given is to be considered. Where there is so much pressure upon the medulla, it may be that the depressing influence of the anesthetic is sufficient to upset the already precariously kept balance. On the other hand it would not be easy to explore both sides of the cerebellum with local anesthesia, though it might be worth trying. It has been asserted recently that chloroform always produces heart failure before respiratory failure. In this case there seems little doubt that chloroform precipitated the respiratory failure without interfering greatly with the action of the heart.

4. *The Respiration.*—The beginning and carrying through of the whole operation, in spite of the patient making no attempt at breathing, was amply compensated for by the immediate return of activity in the respiratory centre when the abscess was opened. One other point as to the cause of death is whether the cavity being emptied quickly caused edema to occur in the medulla oblongata when the pressure was suddenly relieved; whether it would have been better to allow the cavity to empty very slowly, so that vessels with their walls paralyzed by pressure might have time to recover.

STCLAIR THOMSON.

Direct Endoscopy of the Upper Air Passages and Œsophagus; Its Diagnostic and Therapeutic Value in the Search for and Removal of Foreign Bodies.—GUSTAV KILLIAN, Freiburg—*Journ. of Laryngology*, Sept., 1902.

By means of œsophagoscopy the gullet may be systematically searched from above downwards. The author records a case of a tooth-plate in the œsophagus of a female 52 years of age, which the Roentgen-rays failed to discover, but was found by means of the œsophagoscope. The foreign body was impacted and could not be removed with a pair of long tubular forceps. After three attempts with the galvano-cautery snare, the plate was cut through and the two pieces were then easily removed with forceps. A good recovery followed. In cases where one is able to see that the wall of the gullet has been deeply injured, extraction should not be attempted. Early œsophagotomy is indicated, and it is easier to locate the injured part while the foreign body is still fixed.

By means of straight tubes, introduced into the trachea and bronchi under cocain anæsthesia of 25 per cent solution, the author has been able to examine these parts, and at the same time has succeeded in removing foreign bodies from this locality. If there is much dyspnoea, a preliminary tracheotomy is necessary. When this has been performed, and the foreign substance has not been coughed up, a short tube may be introduced through the wound into the cocainized trachea and the search may be continued—lower direct tracheotomy—a method employed by Pilmazek.

When the asperated foreign body has become fixed in the bronchi below the bifurcation, longer tubes are employed, which are introduced into the cocainized bronchi. The author remarks that we may, without fear, press the bronchi, which are highly elastic tubes embedded in soft tissue, into the median line and bring trachea, large bronchus and branch into one straight line.

Bronchoscopy allows the whole bronchial tree to be searched. The view has to be kept clear by sponging the secretion away, or by sucking it up by means of a small pump, designed by the author. For illuminating purposes the Kirstein's forehead lamp is recommended. If a tube is introduced into a principal bronchus, which is entirely stopped up by a foreign body, respiratory difficulties will at once occur, as air cannot pass into the other healthy lung at the side of the tube; under such circumstances the tube introduced should have a lateral opening at some distance from its lower end.

For the removal of foreign bodies from the bronchi a good view, great care and quietness in procedure are essential. Slender tubular forceps, blunt hooklets (in the form of Lister's hook) are the instruments of most use. Their manipulation at so great a depth is not an easy matter but may be learned and practiced on a phantom which has been constructed for the purpose.

Bronchoscopy has been employed in twenty cases, of these eleven were those of the authors, a few of which are given in detail.

M. D. LEDERMAN.

The Diagnosis and Treatment of Malignant Stricture of the Oesophagus.—C. J. AYMARDS, London—*Journ. of Laryngology*, Sept., 1902.

In a classical paper upon this subject, the author summarizes the diagnosis as follows:

1. Among early symptoms we may base so-called "dyspepsia," nausea and repulsion for food; pain alone when the central district is affected.
2. That the passage of a bougie is the only way to clear up the diagnosis, and that its employment need not be feared.
3. That extra oesophageal diseases rarely gives rise to serious dysphagia.
4. That spasmodic obstruction, apart from the hysterical form, has always, when decided, an organic cause and that this would be better called intermittent dysphagia.

All organic obstruction in the upper third of the oesophagus may be considered malignant, but have a special tendency to cicatrize. In the central half of the gullet a sarcoma or a myoma, both rare diseases, may cause fatal obstruction; and here also, a pouch may give rise to difficulty in diagnosis. In the lower portion of the gullet a simple stenosis may occur, and it may be difficult to distinguish between such a condition and a cancer of the stomach, causing great reduction of the cavity (leather bottle stomach). Considerable attention is devoted to the treatment of the disease.

M. D. LEDERMAN.

A Case of Acute Labrynthine Deafness to Speech.—M. GRONLUND—*Hospitalstidende*, 1902, No. 41.

Harold R. age 15 years ships-boy. The parents are healthy, no consanguinity. He is the oldest of five children, all whom are well and he himself was healthy until September, 1900, when on a voyage from Pernambuco to Jamaica, he suddenly fell sick, cause unknown. He went to bed complaining of severe headache and stomachache, the impaired hearing developing simultaneously, and increasing during the rest of the voyage. At the examination the patient appeared stupid and unappreciable, there was much swaying and tottering, when he closed his eyes. The patella reflex was present. There was present otitis media and acute catarrh; ophthalmoscope showed normal. Examination with the Bezold-Edelmann tuning forks revealed partial deafness to tones, including or approaching the parts of the scale necessary to the comprehension of language. One year and a quarter later the gait was natural, he stood firmly with closed eyes, foot to foot, and understood short sentences. On the examination of the continued scale of tones, deafness of the following parts was noticed. GOTTLIEB KIAER.

A Case of Cancer of the Larynx Cured by the X-Rays.—W. SCHEPPEGRELL, New Orleans—*N. Y. Med. Journ.*, Dec. 6, 1902.

The growth was observed in a male patient, 57 years of age, who complained of hoarseness for six months, which was gradually getting worse. The mouth and pharynx were normal, and the tumor involved the left wall of the larynx, and the cord on the same side. There was also a paralysis of this cord. No enlargement of the cervical glands were observed. Seventy applications of the X rays were carried out in succession. After this period of treatment the mass that had projected into the lumen of the larynx had disappeared, including also a large portion of the left vocal cord, which had been diseased. All difficulty of respiration had disappeared and also the pain. Expectoration was still present, but had lost its purulent character, though occasionally streaked with blood. Ten further treatments with the X rays were given, at the end of which time the ulceration in the larynx had healed. Two months later no return of the disease was observed and the patient had resumed his practice of law. No syphilitic history was obtained, though a therapeutic test was made with negative results. No microscopical examination of the growth was made, as the diagnosis was made from the clinical history and laryngoscopic examination.

M. D. LEDERMAN.

BOOK REVIEWS.

Atlas and Epitome of Diseases of the Mouth, Pharynx, and Nose. By Dr. L. GRÜNWARD, of Munich. *From the Second Revised and Enlarged German Edition.* Edited, with additions, by JAMES E. NEWCOMB, M. D., Instructor in Laryngology, Cornell University Medical School; Attending Laryngologist to the Roosevelt Hospital, Out-Patient Department. With 102 illustrations on 42 colored lithographic plates, 41 text-cuts, and 219 pages of text. Philadelphia and London: W. B. Saunders & Co., 1903. Cloth, \$3.00 net.

This, the latest in the series of Saunderson's Medical Hand-Atlases, is the most acceptable of the series in our opinion, and no praise which we can offer of the excellence of this volume would be too extravagant. The illustrations are numerous and exceedingly well executed, and the selection of the material has been most judicious.

The volume is additionally enhanced in value by the remarks of the editor and the incorporation of extensive notes, including the use of Adrenalin, and editorial comments throughout the text making the volume thoroughly up-to-date and adding to its worth to American readers.

This volume is invaluable, and each of our readers should possess a copy.

M. A. G.

The American Year-Book of Medicine and Surgery for 1903 (Surgery). A yearly digest of Scientific Progress and Authoritative Opinions in all branches of Medicine and Surgery, drawn from journals, monographs, and text-books of the leading American and foreign authors and investigators. Arranged, with critical editorial comments, by eminent American specialists, under the editorial charge of GEORGE M. GOULD, A.M., M. D. In two volumes—Volume I, including *General Medicine*, Octavo, 700 pages, fully illustrated; Volume II, *General Surgery*, Octavo, 670 pages, fully illustrated. Philadelphia, New York, London: W. B. Saunders & Co., 1903. Per volume, cloth, \$3.00 net; half morocco, \$3.75 net.

This excellent year-book comes to us in the same dress as last year in two volumes. Volume II (Surgery) contains the matter of special interest to our readers—the chapter on Diseases of the Nose, Throat and Ear. In previous volumes contained separate chapters on Otology and Laryngology by different authors; this year the subject matter in these several departments has been included in one chapter under the able editorship of Drs. D. Braden Kyle and George Fetterolf. The analyses have been carefully made and are briefly presented. Some of the literature cited, however, has been published prior to 1902. This chapter, as a whole, is very good.

In another chapter (Plastic Surgery, etc.) a very comprehensive report of paraffin injection in nasal deformities is given. The chapter on Diseases of the Respiratory Tract includes interesting paragraphs on Laryngectomy and removal of foreign bodies from the air passages. The book is brimful of valuable data of progress.

M. A. G.

Die Krankheiten der Nase und des Nasenrachens. Mit besonderer Berücksichtigung der rhinologischen Propädeutik. By DR. CARL ZARNIKO, of Hamburg. Second revised edition. First part: Propädeutik. With 88 illustrations and 3 plates; 264 pages, octavo, paper bound. Publisher, S. Karger, Karlstrasse 15, Berlin. Price, \$1.50.

The introductory (Propädeutik) section of Zarniko's work is before us, and the first impression to the reader is its stamp of originality in arrangement, illustrations and text.

The first chapters containing anatomical and physiological observations are especially worthy of mention for their excellent descriptions and accompanying diagrams and photographs of the accessory sinuses.

Chapter III, on general Pathology and Symptomatology includes well-written paragraphs on stammering, stuttering and the relationship of the Nose to the Ear, Eye, Brain and general system.

Chapter IV on Diagnosis presents several new features, especially the comprehensive descriptions of tests of the sense of smell.

General Therapy is the concluding chapter of this volume, and presents the German ideas of technique to date.

We believe this to be one of the most wide-awake of the recent German publications in this field.

M. A. G.

Progressive Medicine. Fifth Annual Series. Volume 1, March, 1903. A quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by HOBART AMORY HARE, M. D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia. Octavo, handsomely bound in cloth, 450 pages, illustrated. Per volume, \$2.50, by express prepaid. Per annum, in four cloth-bound volumes, \$10.00. Lea Brothers & Co., publishers, Philadelphia and New York.

The first volume of the fifth series of "Progressive Medicine" is of special interest to our readers, as it contains the chapters on Laryngology and Otology.

In the section on Laryngology and Rhinology our esteemed collaborator, Dr. A. Logan Turner, of Edinburgh, presents a summary of recent advancement, which is a well-written, thorough and careful review rather than a series of abstracts. He presents in a very comprehensive manner the work done in the correction of nasal deformities by means of paraffin injections, the treatment of ozæna by paraffin injections, an excellent chapter on progress in the work on the accessory sinuses, and shorter paragraphs on general anæsthesia in minor operations upon the nose and throat, the X-ray and light treatment, and foreign bodies in the upper air passages.

Dr. Robert Randolph's chapter on Otology is devoted largely to a discussion of the methods employed in the treatment of various chronic aural conditions, heretofore considered as almost hopeless from a therapeutic standpoint.

The section on Surgery of the Head, Neck and Chest contains good paragraphs on the thyroid gland and œsophagus. The paragraph on diphtheria also deserves special mention.

M. A. G.

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